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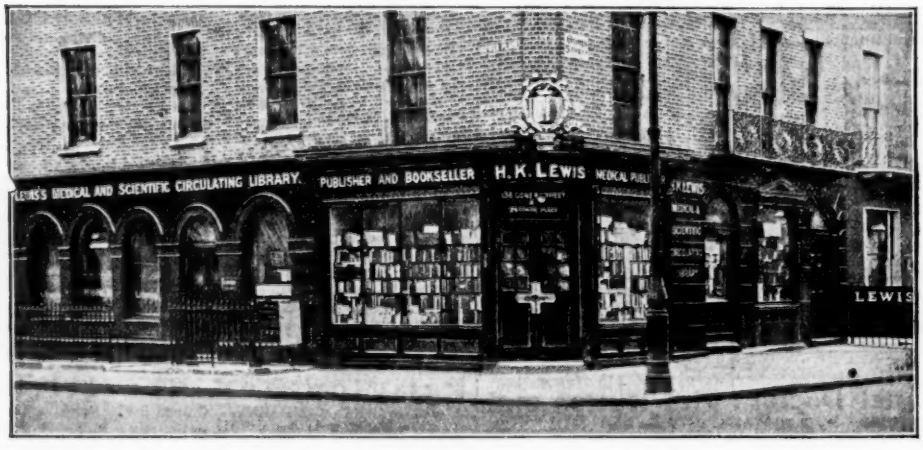

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PHYSICIAN, GREAT NORTHERN CENTRAL HOSPITAL; ASSISTANT PHYSICIAN, NATIONAL HOSPITAL FOR DISEASES OF THE HEART.

(II.) PAROXYSMAL TACHYCARDIA.

THE introduction of the clinical polygraph and the electrocardiograph in the examination of the heart has thrown a flood of light upon the condition called paroxysmal tachycardia. By means of these instruments we are able to obtain records of the movements of both the auricles and ventricles, and also to make out the time-relations of the contraction of these chambers; unlike the sphygmograph, which affords information regarding the movements of the left ventricle alone.

Nature of Paroxysmal Tachycardia.

The term paroxysmal tachycardia is here employed to denote a condition, not uncommon, in which a marked acceleration of the cardiac rate occurs, which commences suddenly and abruptly and without apparent cause, lasts for a varying period, ceases suddenly and abruptly, and is due to an abnormal rhythm—the stimulus for cardiac contraction, instead of arising at the junction of the great veins with the auricle, having its origin at an abnormal point. The return of the cardiac rate to what it was prior to the paroxysm is due to the reversion of the cardiac rhythm to the normal. From the definition given it will be seen that paroxysmal tachycardia does not include acceleration of the cardiac rate associated with the normal or sinus rhythm.

It should be noted that the nature of the abnormal cardiac rhythm is not always the same; in other words, the condition which gives rise to the paroxysm of tachycardia varies. The point of origin of the new rhythm is usually situated in the auricle, and the ventricle responds to impulses received from that chamber; but it may rarely arise in the ventricle, and in this case the auricle responds to impulses received from the ventricle. The two commonest causes are temporary auricular fibrillation and auricular flutter, but there may occasionally be other causes.

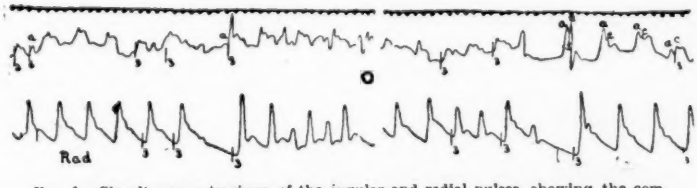

FIG. 1.—Simultaneous tracings of the jugular and radial pulses, showing the commencement and termination of a short attack of paroxysmal tachycardia, due to auricular fibrillation. The first six beats and the last three in the sphygmogram are regular and due to a normal contraction of the heart. The beats between occur during a period of auricular fibrillation. At O a period of fifteen seconds has been cut out (Mackenzie).

The paroxysm of tachycardia may last only for a few beats or may persist even for months; as a rule, it lasts for some hours, and only exceptionally does it continue for several weeks, and rarely for months. The patient may experience one attack and never have another, or he may be subjected to many in the course of 24 hours, or the attacks may occur at varying intervals, frequent or long, for many years. Permanent auricular fibrillation or flutter may supervene.

Etiology.

The etiology of paroxysmal tachycardia is obscure. It may occur at any age after five, but usually first occurs during middle life. It appears to be more common in males, and this certainly agrees with my experience. A history of previous infection by rheumatism is not uncommon and a fair proportion of cases are the subjects of valvular disease, particularly of mitral stenosis, or of myocardial degeneration, but no evidence of organic disease of the heart is found in a considerable proportion of cases. The condition has been noted in association with alimentary toxæmia, in reflex irritation, neurasthenia, and other morbid states. Among exciting causes are physical exertion (Figs. 2 and 3), emotional excitement, digestive disturbances—particularly flatulent distension of the stomach or colon, and in one of my own cases the adoption of a certain posture appeared to bring on the attacks.

Symptomatology.

In some cases there is limitation of the field of cardiac response between the attacks, such as dyspnœa and præcordial distress on exertion. Other cases are absolutely free from subjective symptoms in the intervals, but in many cases auricular or ventricular extra-systoles are to be observed.

It has been already noted that there is a sudden, abrupt, and great acceleration of the cardiac rate, coming on without apparent cause, while at the end of the paroxysm there is a sudden and abrupt return to the rate and cardiac rhythm which preceded the attack. In some cases the patient is able to recognise the onset and termination of the tachycardia, while in others he is unable to do so. After the onset the patient may be unconscious of the tachycardia, if the attack be brief; but, if it persist for any time, he usually becomes conscious of it, and generally complains of a fluttering sensation in the chest, this sensation being unlike that of palpitation. The patient may also experience a sensation of pulsation in the neck. His face is usually pale, and has an anxious expression. The cardiac rate is usually above 140 per minute and may reach even 300; in a majority of the paroxysms it is between 150 and 190; it should be counted at the apex, either by palpation or auscultation, unless it is extremely rapid, when graphic methods are necessary. The pulse is of smaller volume than normal and its character may resemble that of the pulsus celer. It may be quite regular, or very irregular when the condition is due to auricular flutter in which the response of the ventricle to auricular contraction is at irregular intervals, or *completely* irregular when the result of auricular fibrillation. A noteworthy feature is the frequent presence of pulsus alternans, but this can only very rarely be made out by the finger. The blood pressure is generally lower during the attack. The area and force of the apex-beat may be increased. The jugular veins may be distended and may show very rapid pulsation.

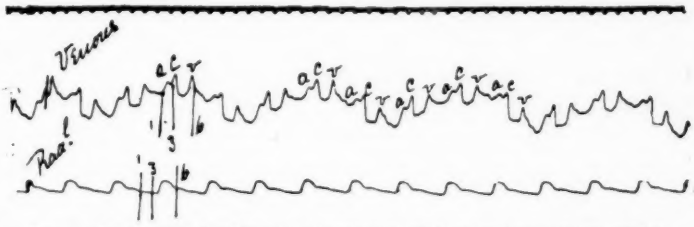

FIG. 2.—Simultaneous tracings of the jugular and radial pulses from a patient subject to attacks of paroxysmal tachycardia, due to auricular flutter. The rhythm of the heart is normal and the pulse-rate is 83 per minute.

During the attack the common indications of cardiac failure may be present, their severity depending upon the cardiac rate, the duration of the paroxysm, and the integrity

of the myocardium. In some cases, even when the paroxysm lasts for a day or two, there may be only some limitation of the field of cardiac response, with little, if any, cardiac dilatation, hepatic enlargement, or dropsy; while, in long-continued paroxysms, and even in some cases in which the paroxysms last for only a few hours, cardiac failure may be extreme. There may be dyspnœa on exertion, a feeling of discomfort, oppression, or actual pain in the chest, lassitude, weakness, or exhaustion; pallor of the skin, with undue prominence of the superficial veins, cold perspiration, an anxious expression of the face, and symptoms of cerebral anæmia—such as giddiness and faintness; flatulence, nausea, and vomiting may also be present. Later on cyanosis, cough with expectoration, and even hæmoptysis and signs of œdema of the bases of the lungs may be present.

The area of cardiac impairment may become considerably enlarged — even within a few hours, the first sound of the heart shortened, sharp, high, and clear in pitch, the long pause is often shortened, while the rhythm of the sounds sometimes resembles that of a fœtal heart, and if murmurs were previously present they alter in character or even disappear. There may be tenderness of the præcordium and hepatic area, the liver may be palpable and pulsating, ascites and general anasarca may occur, and the urine may become scanty, high-coloured, and albuminous.

Analysis of the polygraphic tracings gives different results according to the site from which stimuli for contraction arise, and the electro-cardiograms present different features according to the point of origin and path of conduction of the stimuli for contraction. In all probability they will show auricular fibrillation (Fig. 1) or auricular flutter (Figs. 2–4) as the cause of the attack; but, as already noted, there may occasionally be other causes. (Figs. 5, 6, and 7.)

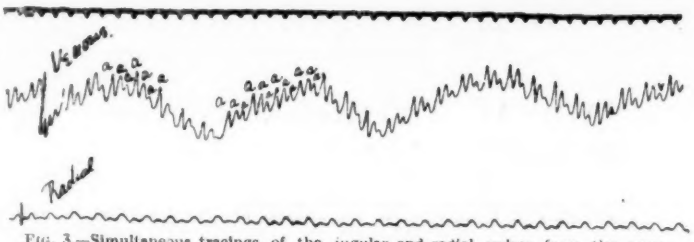

FIG. 3.—Simultaneous tracings of the jugular and radial pulses from the same patient as Fig. 2, after walking for about a quarter of a mile. The exertion induced an attack of auricular flutter. The auricular rate is 382, and the ventricular rate 187, per minute.

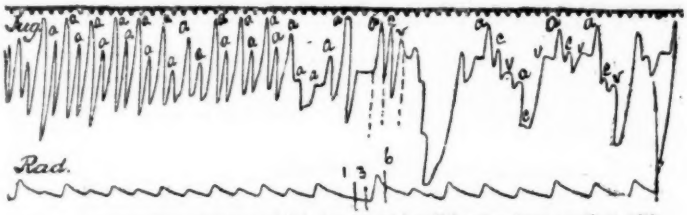

FIG. 4.—Simultaneous tracings of the jugular and radial pulses from a patient with myocardial and arterial disease, showing the termination of an attack of paroxysmal tachycardia, due to auricular flutter. The first part of the tracing shows auricular flutter, with 2 : 1 heart-block, the rate of the auricle being 232, and the ventricular rate 116, per minute. The normal rhythm of the heart is resumed after the long pause with the beat 1, 3, 6.

A remarkable and characteristic feature of the condition is that with the sudden reversion of the rhythm to the normal there is an extraordinarily rapid recovery to the state in which the patient was prior to the paroxysm; within a few hours there may, indeed, be no evidence of cyanosis, distension of the veins, cardiac dilatation, or enlargement of the liver. In some cases the cessation of the attack is accompanied by the passage of large quantities of wind, and excessive eructations, while a large quantity of urine may be voided. Death during the attack is not common.

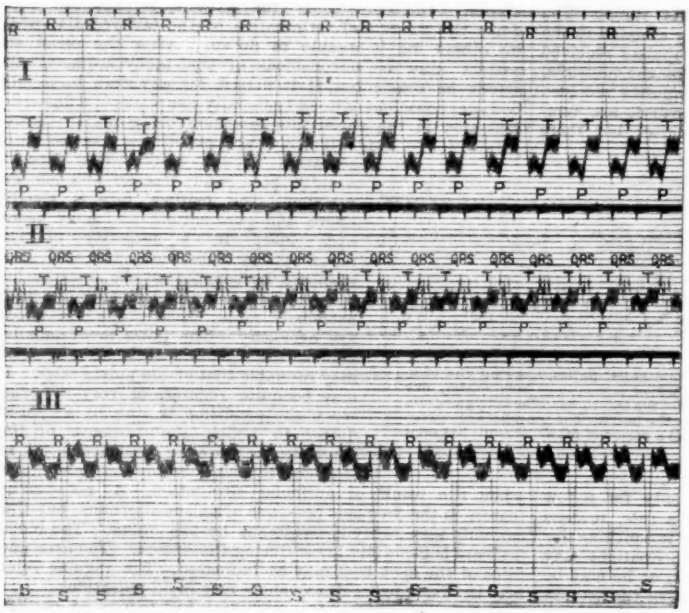

FIG. 5.—Electro-cardiogram from a case of paroxysmal tachycardia. The point of origin of the new rhythm is situated in the auricle. The P deflection is inverted, and coincides with the ventricular contraction of the preceding cardiac cycle. The rate is between 180 and 190 per minute.

Diagnosis.

The diagnosis of paroxysmal tachycardia is usually not difficult. The most important points from the diagnostic point of view are (1) the cardiac rate and (2) the commencement and termination of the attack of tachycardia, the second of these being the more important. With regard to the cardiac rate, a persistent ventricular rate of over 160 is almost invariably due to an abnormal rhythm, and a persistent rate of over 140 may be due to the same cause. Tachycardia of a rather less severe grade must certainly not be presumed to be due to an abnormal rhythm. There are, however, distinguishing features between tachycardia due to a normal and that due to an abnormal rhythm. The suddenness and abruptness of the onset and termination of the tachycardia is a characteristic feature of the latter — the maximum rate is attained within a few seconds, and the return of the cardiac rate to what it was prior to the attack takes place equally quickly, whereas in tachycardia associated with a normal rhythm the onset and offset are gradual; and, further, as Lewis has pointed out, the cardiac rate is not influenced by change of posture or other forms of physical exertion, as is the case in tachycardia not associated with an abnormal rhythm. Polygraphic

or electro-cardiographic examination will put the diagnosis beyond all doubt.

Prognosis.

The difficulty in forming a prognosis in any case of paroxysmal tachycardia is great. The prognosis may be considered from two standpoints: (1) that of a particular paroxysm, and (2) the question of recurrence of the attacks. With regard to the former it may be noted that death during an attack is comparatively infrequent, although this may occur when the duration of the attack is prolonged. The points which should be taken into account in considering the prognosis of an individual attack are the ventricular rate, the duration of the attack, and the degree of cardiac failure present. When the ventricular rate is not very high, and there is little or no cardiac dilatation, and an absence of œdema of the lungs, hepatic enlargement and anasarca, the outlook is good as far as the risk to life is concerned; while, on the other hand, if the clinical picture be the reverse, the outlook is uncertain, although it should be remembered that the paroxysm may cease at any time and there is no means of knowing when this may occur, and the patient improves with extraordinary rapidity.

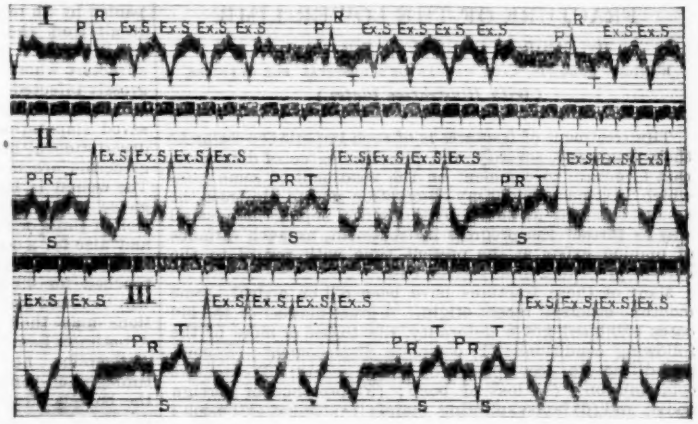

FIG. 6.—Electro-cardiogram showing short paroxysms of extra-systoles, which arise in the right or basal portion of the ventricle. There is also inversion of T in lead I, and left-sided preponderance.

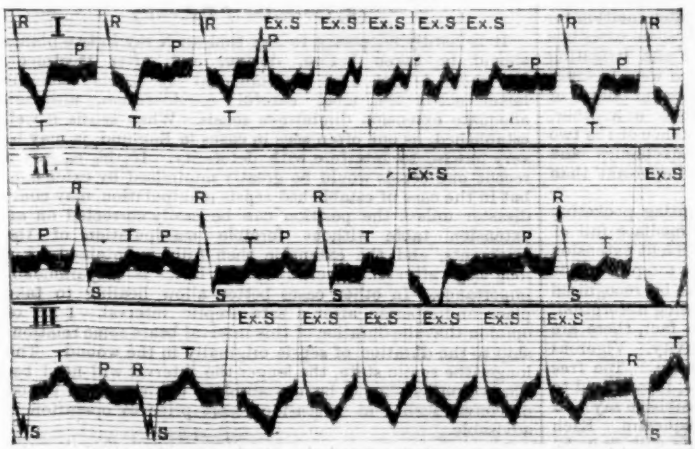

FIG. 7.—Electro-cardiogram showing: in lead I, a single extra-systole, followed by a short paroxysm of four extra-systoles; in lead II, two single extra-systoles; in lead III, a short paroxysm of six extra-systoles. The "normal" R's are wide and of unusual form in all leads; there is probably a right-sided bundle lesion. The P–R interval is increased, being 7·25 seconds. There is also inversion of T in lead I.

With regard to the question of the recurrence of the attacks, it is impossible to give an answer. For in some cases the patient may never suffer from a second attack; while, on the other hand, they may recur even several times in the course of 24 hours, or at frequent intervals for many years, or, lastly, permanent auricular flutter or fibrillation may supervene even after a few attacks. An attempt should be made to estimate the degree of integrity of the myocardium between the attacks, and the best way to ascertain this is to find out how the heart responds to effort. If the field of cardiac response be not diminished, and the attacks be infrequent and transitory, the cardiac rate not being much increased, with an absence of or only a slight degree of cardiac failure during the paroxysm, the prognosis may be considered good.

Treatment.

The results of treatment of this disorder, in the great majority of cases, are very unsatisfactory. It is true that the paroxysm not infrequently ceases when various remedies are applied; thus, bringing up of wind, the act of vomiting, the adoption of a certain posture, pressure upon the vagus—particularly the right, friction of the chest-wall, and local applications in the form of an ice-bag, mustard leaves, or warmth to the præcordium, may be followed by relief. But it should be remembered that the nature of the disorder is to stop suddenly, and, therefore, the question of *post hoc* and *propter hoc* always arises. As far as my observations have gone, the remedy which offers most encouragement is strophanthin injected intravenously. One dose of 1/100 gr., or two or three doses of 1/250 gr., every two hours, may be administered. Failing this, digitalis should be given by the mouth and pushed to the full physiological reaction. If there be indications of heart failure, such as dyspnœa, cyanosis, or dropsy, these should be treated on general lines.

Between the attacks, the general condition, and whatever appears to be the exciting cause of the paroxysms, should receive attention. Any gastro-intestinal disorder should always be corrected. Bromides may be tried. In one case — and in one only — in my experience, the continuous administration of digitalis proved effective.

MATERNITY HOME AT EXETER.—The Exeter District Nursing Association will in a few days open a maternity home. The Exeter City Council has decided to share the expenses of equipment and maintenance conditionally on two beds being available for cases recommended by the medical officer of health.

RICHARD HENRY GRIMBLY, M.R.C.S., L.S.A., O.B.E.—Mr. R. H. Grimbly, honorary surgeon, Newton Abbot Hospital, who died at his residence at Newton Abbot (Devon) on April 4th, aged 65 years, had practised for many years at Newton Abbot. He was a member of the Newton urban council and a prominent Freemason. Mr. Grimbly was greatly interested in ambulance work, was Deputy Commissioner for the Western Counties, and an Honorary Associate of the Order of St. John of Jerusalem. It was principally due to his exertions that the Newton Abbot V.A.D. Hospital, which will soon contain 150 beds, was established. He was medical officer in charge up to his death, and recently Mr. Grimbly was decorated by the King with the Order of the British Empire. Mr. Grimbly will be greatly missed.

REMARKS ON THE TREATMENT OF FRACTURE OF THE LOWER LIMB.

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(*With Illustrative Plates.*)

THE treatment of fractures is of such importance owing to their frequency, severity, and possible degree of deformity, that I venture to comment on the treatment of some cases which have come under my observation and to illustrate the results obtained as shown by the X ray, hoping in a small way to further the progress in treatment, as such variance of opinion exists at the present time with regard to the correct procedure in any given case.

Many of these fractures have been old on arrival—some months—others of recent origin. A great number of the old cases exhibited grave deformity, due to one or more of the following conditions: (1) complete displacement; (2) compound fracture, accompanied by severe sepsis; (3) extensive comminution; (4) loss of bone; (5) presence of foreign body; and (6) faulty splinting, mainly insufficient extension; absence of lateral tension, non-adoption of correct position of limb.

The treatment resolved itself into dealing with (*a*) sepsis; and (*b*) correction of deformity.

(A) *Sepsis.*

Sepsis is chiefly caused by inadequate drainage or lack of extension or else by the presence of foreign body or sequestra in many cases. Many methods have been advocated to combat this frequent complication. One is tempted to say that the principal treatment of sepsis by suitable incision for drainage is in some degree overlooked. In some cases one has found various treatments by antiseptics and irrigating fluids unsuccessful, as drainage and extension were lacking. The war has at times tended to produce passing phases of popularity amongst surgeons for one antiseptic or another, and at the same time subordinated the importance of the two factors—viz., drainage and extension. Mechanics and judicious operative intervention are more important than chemistry in these cases.

Extension alone helps drainage by preventing pocketing of pus and allowing freer circulation, an immediate fall of temperature ensuing in many cases when sufficient extension had not previously been applied. One can be too precipitate in dealing with this condition, and it should be recognised that sepsis, if not under tension, is not causing absorption, and urgent treatment is not called for. In fact, there are dangers ahead associated with too much activity. Vigorous extension may lead to secondary hæmorrhage. Too free removal of comminuted bone is not advisable, it may lead to considerable shortening. It is almost impossible to say how many pieces will eventually die and form sequestra. Each piece that survives will be of great help, and will limit the extent of a possible future bone-graft. Should a large number of sequestra form no harm results, provided drainage is good. In fact, the throwing out of new bone would appear to be stimulated by their presence.

Treatment.—The treatment adopted in an early stage should be that of keeping the sinus or wounds clean while the limb is splinted in the most suitable position with extension, leaving free access for dressings to be applied with as little disturbance as possible to the fracture. Syringing sinuses is a practice involving some danger of spread of infection. A funnel and a tube at a moderate level is preferable. If a sinus is discharging it is performing its duty, washing its outlet only is of no great service. Probing sinuses is also a danger and should never be done except by the surgeon. Better let the sinus do its work until it is decided to operate for removal of the offending source of infection.

Although many new forms of treatment have been introduced, fomentations remain one of the most useful remedies against sepsis. They help Nature to deal with infection that has penetrated into the wound and sinus walls. They are advantageous in cases of acute sepsis with lymphangitis or even in cases of cellulitis. In the latter symptoms will improve by the diminution of tension caused by the fomentations. Should an operation be then necessary, the areas requiring incision will be more clearly defined.

In these conditions good results follow a very minute dose of autogenous vaccine, $\frac{1}{4}$ to 1 million streptococcal, accompanied by an injection of serum. I have seen great benefit result from the use of sulphur and glycerine and a large fomentation in very acute septic conditions in the region of a fracture where there was a large wound with the soft tissues grossly infected. Incision alone would have done little good. In several extremely severe septic cases this treatment has saved amputation. On this account I think it worthy of description, although glycerine is now so scarce. Sulphur and glycerine are mixed till a creamy consistency is formed. The wound is lightly filled with this cream, sometimes on gauze, taking care that it does not act as a plug, a fomentation of three or four layers is then applied around the wound, and also for a considerable distance above and below it, and surrounded by protective tissue and wool. This is not touched for 48 hours, when usually the patient's condition will be found to have greatly improved. Ordinary fomentations may then follow. I am indebted to Colonel Sir Arbuthnot Lane for suggesting this very useful treatment. Antiseptics, no doubt, are of some value, especially in through-and-through wounds of soft parts or in cases where the bone is tunnelled. Bipp[1] is of great value, and in some conditions may save the destruction of important anatomical structures. Bipp also appears to lessen reaction after operation, such as sequestrotomy. I think, when used, a tube should be inserted which reaches to the depth of the wound, and the wound only partially closed; the tube should be removed in 48 hours.

Unnecessary search for foreign bodies is inadvisable, but if readily accessible they should be removed. Drainage-tubes have their uses, but the sooner they can be dispensed with the better.

(B) *Correction of Deformity.*

It is hardly necessary to say that an X ray in two planes should be taken before, during, and after treatment. Deformity is so often accompanied by sepsis that the latter needs the most careful consideration, although adequate extension diminishes sepsis. When sepsis is well established, as one often sees in cases in England, it may be very unwise to interfere with deformity. If the case is a recent one sepsis would be greatly minimised by extension, but in the case of established sepsis manipulation may court disaster unless the position can be easily corrected on an extension table without forcible manipulation of the fragments, and the extension then fully maintained for a long time after the operation; the latter is of paramount importance. In other cases better allow healing to take place and operate after a safe aseptic interval. I am of opinion that the duration of this interval bears some relationship to the duration of sepsis originally in the wound. The longer the septic state, the longer the interval will need be. Three months should be the absolute minimum. A period of convalescence at a seaside resort prior to operation is advisable.

Such a lot is written and talked about splinting that one feels that the term extension should be used instead. Good results cannot always be obtained by any one method. In my experience, one has at times to rely on operation, at others on various methods of splinting, depending on the individual case. A great many recent cases can, no doubt, be set in accurate position by splints or plaster-of-Paris with metal interruption for dressings, if the fracture is compound. A great deal depends on the site of the fracture, its nature, age, and whether one bone only is broken, as in the leg. The condition as shown by the X ray calls for more than the mere setting of a fracture, it demands as accurate a reposition as is possible in each case, and the maintenance of this reposition, which is so often difficult in spiral fracture. X ray during the treatment is invaluable, showing as it does any alteration of the fragments.

It is often impossible to replace the fractured ends in cases one month or more old, muscles having contracted to such an extent that traction is of no value. Those muscles, especially in femur cases, are of exceptional strength.

An extension table is sometimes successful, and in many cases I have succeeded in greatly improving the condition.

The more bone-plating one sees, the more is one impressed by the futility of trying to reduce deformity by traction in cases of any duration in the axis of the limb. Callus is only

[1] THE LANCET, 1916, ii., 268.

CASE 1 (A, B).—*Spiral Fracture of Left Femur treated by Plating.*

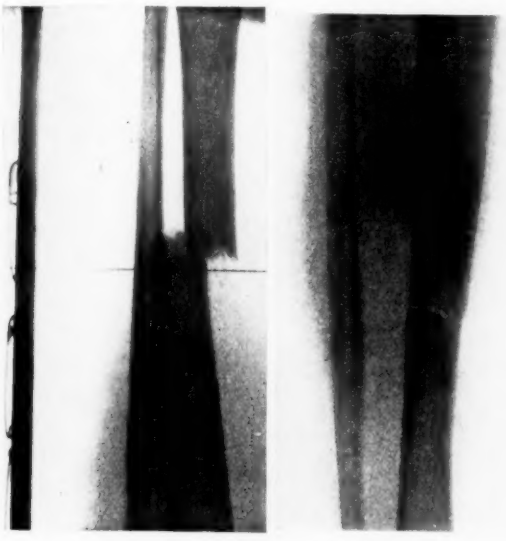
A B

CASE 1.—A, Lieut. B——. Bullet wound, Jan., 1916. Spiral fracture of left femur. Admitted May 15th, 1916. Two inches shortening.

B, Plated July 10th, 1916; walking in ambulatory splint in one month's time; no shortening.

CASE 2 (A, B).—*Transverse Fracture of Left Tibia treated by Open Operation.*

A B

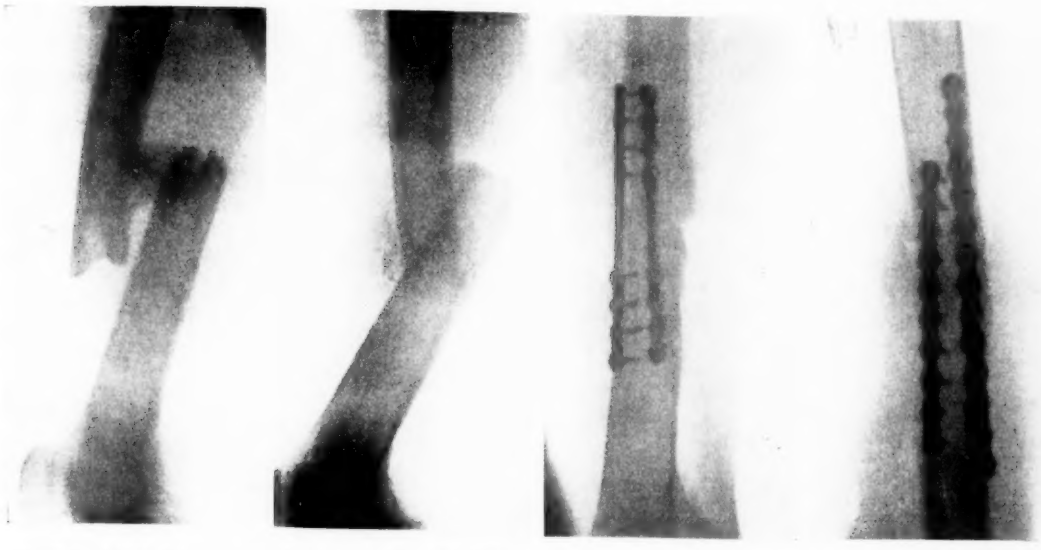


CASE 2.—A, Lieut. P——. Simple transverse fracture of left tibia, August 30th, 1917. No amount of traction or manipulation could have rectified the displacement.

B, After operation, Sept. 27th, 1917. Shows the result obtained by open operation; no plates needed, as bones interlocked accurately.

CASE 3 (A, B, C, D).—*Fracture of Both Femurs treated by Plating.*

A B C D



CASE 3.—Lieut. F——. Aeroplane crash, May 13th, 1917. Admitted July 25th. Fracture both femurs. A, Right femur. B, Left femur.

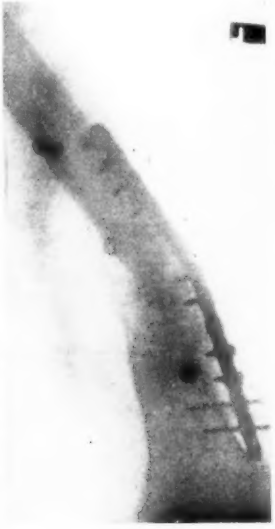
C, Right femur plated August 1st, 1917.

D, Left femur plated Sept. 6th, 1917.

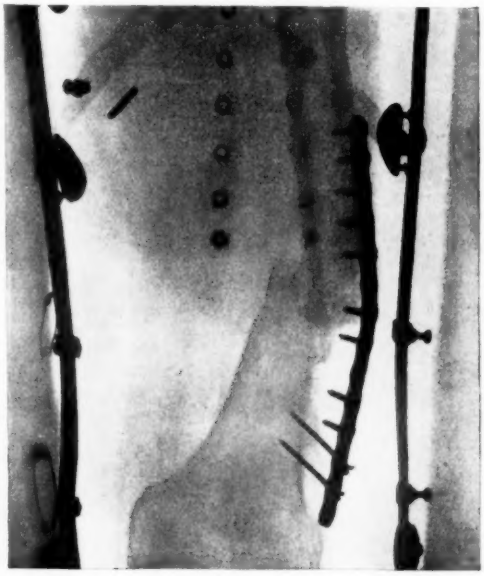
CASE 4 (A, B, C, D, E, F).—*Spiral Fracture of Femur with much Shortening treated by Plating and Splinting.*

A

B



C



CASE 4.—A, Major P——. Bullet wound, Dec. 15th, 1916. Admitted July 17th, 1917. Spiral fractured femur; 3½ inches shortening.

B, Plated Sept. 14th, 1917. X ray one month after operation, shows plate bending and lower screws not holding. Operation was most difficult owing to length of time elapsed since injury. Lower fragment being decalcified, screws held badly under the strain.

C, Ambulatory splint applied same day X ray was taken (Jan. 7th, 1918), which shows more bending of plate and screws giving way; no union. Plate removed and limb put in plaster-of-Paris on Hoefftcke's extension table (Jan. 15th, 1918).

D

E

D, Shows condition in war splint, which was applied Feb. 1st, 1918. Lateral tension was applied with rubber tubing over perforated zinc fastened to the clips on the lateral bars. Zinc plates removed temporarily to avoid obstructing X ray view. Shows marked improvement resulting from plating operation and adequate splinting; ½ inch shortening.

E, War splint with the author's clips applied for lateral tension, without constricting the blood-supply of limb.

CASE 5 (A, B, C).—*Simple Fracture of Left Tibia and Fibula treated by Ambulatory War Splint.*

CASE 4, F. A B C

CASE 4.—F, Standing in Hoefftcke's ambulatory appliance (March 12th, 1918). Posterior view showing transmission of weight of body on the tuber ischii and gluteal region.

CASE 5.—A, Capt. W——. Posterior view in Hoefftcke's war splint.

B, Simple fracture of left tibia and fibula, Nov. 28th, 1917. Admitted Dec. 1st, 1917. X rayed same day.

C, X rayed Feb. 19th, 1918, in war splint; has been walking since Jan. 1st, 1918.

CASE 6 (A, B).—*Simple Fracture of Right Femur treated by Thomas's and Ambulatory War Splint.*

A B

CASE 6.—A, Lieut. C——. Simple fracture of femur; admitted July 27th, 1917. Position corrected in Thomas's splint with weight extension; remained in this splint for two weeks. The limb was then put in war splint; since then has been walking about in comfort.

B, X rayed Oct. 16th, 1917. Shows firm bony union, obtained in 11 weeks. Callus formation was promoted by the blood-supply through exercise and upright position of body.

CASE 7 (A, B).—*Comminuted Fracture of Left Femur treated by Ambulatory Splint.*

A B

CASE 7.—A, Major G——. Wounded July 1st, 1916, by bullet which carried a large piece of the shaft away. X rayed July 24th, 1916. Admitted on 28th.

B, X rayed Nov. 11th, 1916. Shows new bone formation. Treated in Hoefftcke's ambulatory splint all the time no shortening.

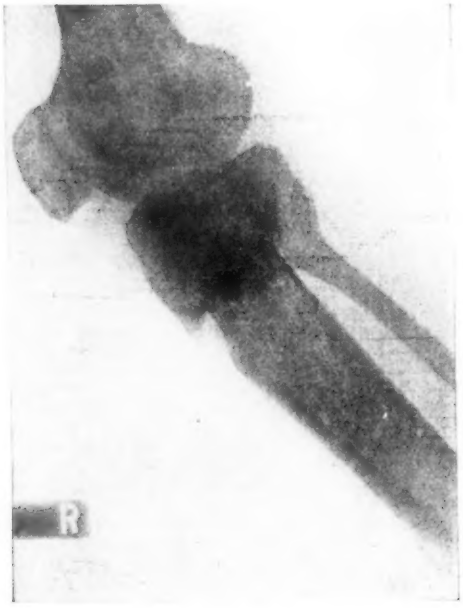
CASE 8 (A, B, C, D).—*Comminuted Fracture of Head of Right Tibia, with Partial Dislocation of Knee, treated by Ambulatory Splint and Whirlpool Baths.*

A

B

CASE 8.—A, Major K——. Aeroplane crash, Nov. 17th, 1915. Admitted Jan. 17th, 1916. X-ray, Feb., 1916. A.-P. view. Partial dislocation right knee. Comminuted fracture of head of tibia, involving joint.
B, A.-P. view, Oct. 10th, 1917. Was extended on extension table. Treated in Hoefftcke's ambulatory splint for ten months. Since that time has dispensed with use of splint; shows marked improvement.

C



D

C, Lateral view, Feb., 1916, showing comminution. D, Lateral view, Oct. 10th, 1917. 45 movement of knee-joint. Whirlpool baths formed part of the treatment to encourage increased movement of knee.

noticeable by its absence in a large number of these cases of complete displacement, even after the period of one or two months.

Lane's method of replacement by open manipulation with powerful bone-lifters, appeals forcibly by its simplicity. Bone-plating in these cases ensures the most accurate apposition of the fragments, which could not be gained by other means.

Bone-plating is stated sometimes to be unnecessary; as far as I can see it is often the only method. The operation requires great skill, and the case must be suitable. Many cases are no doubt treated in this way which are very unsuitable, especially some comminuted fractures. No septic case should be plated.

I am sure trauma during the operation is conducive to sepsis. The operation should be done simply and no finger should touch the wound. The plates should be strong and, if necessary, more than one should be inserted. Sometimes in quite old cases or when there has been much sepsis, the bone is in a decalcified condition and it is difficult to make the screws hold properly. These cases require two or more plates and very careful after-treatment.

It is usual to allow these cases up in a Hoefftcke's ambulatory splint within one month after operation. It is sometimes said that the plate delays osteogenesis. I am of opinion that malunion is more often a sign of bad apposition or disuse of the limb, and is not attributable to the presence of a plate. Where correction is perfect very often little callus is thrown out, as there is no call for it. When the patient is allowed to walk in an ambulatory splint the slight amount of strain involved stimulates its deposition. I would advocate the use of such a splint for cases of non-union provided apposition is fairly good. Given sufficient time proper union will take place.

In some cases of fracture, such as a transverse fracture of the tibia alone, open manipulation is sufficient without any plating, and in these cases traction is futile.

One has in all cases to take into consideration the apparent exaggeration of deformity shown by X ray. An inspection of the photograph alone would urge interference, whereas on inspection of the limb one may find that a moderate amount of extension may improve the condition quite sufficiently for a good functional result to be obtained with firm union. This points clearly that a careful choice must be made of the case desirable for operation. Operation will often give the best result in the shortest time, and is therefore often the ideal treatment.

I have used a Thomas's splint frequently, but have always applied weight extension (14-25 lb.) at times to the extension strapping and at others to a spat. The Thomas splint being tied to the end of a high bed-rail the patient is thereby pulled into the splint, the counter-pressure being mainly felt in the crutch. This causes some discomfort. After a time the muscles relax if the discomfort is relieved by the inclined-plane position of the limb; the weight then fully exerts its influence. I have found that Sinclair's method of bending the Thomas is of great service in restoring the antero-posterior curve of the femur. A stirrup may be dispensed with by passing the extension cords through two loops of cord which surround the lateral bars of the splint. The patient can be put in a chair for a few hours each day when union is fairly well advanced by joining the extension cords below these loops and then attaching the junction by rubber tubing to the end of the splint.

I have frequently used the Hoefftcke war splint for fracture of the lower limb. Considerable extension can be borne comfortably, and the patient can walk about after he has been in it for some few days with comparative ease. But in septic cases it is better to keep the patient in bed for a few weeks, and when allowed up the amount of congestion of the limb must be carefully watched. If excessive, the patient should return to bed and the limb be put in a slightly elevated position until the swelling has diminished.

This splint is of great service; it is telescopic and the upper flanges for counter-extension are adjustable, so that any case can be fitted accurately and comfortably without any pressure on the pubic bone or perineum. A pair of Dakin's pads are most useful for padding under these flanges.

Sinclair's glue extension or adhesive plaster can be used for the purpose of extension in either the Thomas or the war splint. But a properly moulded spat will fit any foot, and if correctly applied will not cause any pressure-sores in the ankle region. When union has progressed the splint should be taken off and the knee- and ankle-joints moved occasionally to ensure good joint function. If extension of the limb has been well maintained during the treatment the movement of the joint will not be much interfered with.

If the case is likely to be of long duration the Hoefftcke ambulatory splint may be necessary. This latter is very useful when joints are involved, as the cartilages are kept apart and movement can be encouraged, allowing cartilage repair to progress. The deposition of callus is greatly aided by the upright position and exercise and consequent increased blood-supply to the site of fracture

Lateral deformity can be greatly improved even in quite old cases by applying lateral tension with rubber tubing. A curved bar of metal 6 or 7 inches long is fixed by clips and screws at right angles to the lateral bar of any of these splints, a peg being at each end of the bar. These pegs are connected round the limb by the tubing which lies over the point where pressure is desired, wool and a curved piece of aluminium or zinc being underneath the tubing. By this means pressure is exerted only where needed and the limb is not constricted.

I wish to express my gratitude to Colonel Sir Arbuthnot Lane for his constant advice and extremely skilful operative technique in these severe cases, and to Mr. Charles Ryall for his invaluable help.

I also wish to thank Mr. C. A. Hoefftcke for the loan of his extension table on many occasions and for his attention and help in the many cases where I have used his splints, also for his compliance with any of my suggestions for improvement.

I trust the cases shown will illustrate sufficiently some of the points referred to.

A STUDY OF THE CARDIAC DISABILITIES OF SOLDIERS IN FRANCE
(V.D.H. AND D.A.H.).

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IN this paper an attempt is made to put on record the results of an inquiry into the cardiac and circulatory conditions of 5000 soldiers who have been sent to a base with the disagnosis of "V.D.H." (valvular disease of the heart) and "D.A.H." (disordered action of the heart). All these cases were admitted to a convalescent camp, and on admission a history was taken and a physical examination was made under the following headings:—

Name.	Rank.	Regiment.	Age.	Service.		Symptoms and duration.
				Total.	France.	

Heart.				
Tenderness.	Rate.	Rhythm.	Size.	Sounds.
Arteries and blood pressure.	Previous health and habits.		Progress.	Disposal.

At the first examination 8·3 per cent. of patients were found to be suffering from easily recognisable diseases which were in no way circulatory in origin, and this group does not enter into the statistical tables compiled during this inquiry. The remaining 91·7 per cent. of patients complained chiefly of breathlessness, pain in the chest, palpitation, giddiness, and other less easily definable symptoms. Though the symptoms probably owed their origin to many different causes, they were so predominant that for descriptive purposes the group may be considered as an entity. This entity has been described as the soldier's heart, the irritable heart of soldiers, and in the Army nomenclature as disordered action of the heart (D.A.H.). In this group are included for the moment cases of organic disease of the heart.

Table I. shows that 55 patients suffered from gross organic disease of the heart out of a total of 1000 patients sent with a diagnosis of V.D.H. or D.A.H. All the tables in this inquiry have been compiled from 1000 cases, and this figure is sufficiently large for the conclusions drawn from it to be applied to the total of 5000. 138 cases of D.A.H. have been

added to the 862 cases of Table I. in order that a correct analysis of 1000 cases of D.A.H. may be given.

TABLE I.—*1000 Cases sent as "D.A.H." or "V.D.H." (Actual Diagnosis).*

—	Number.	Percentage.
Other diseases	83	8·3
V.D.H.	55	5·5
D.A.H.	862	86·2
Total	1000	100·0

As the analysis proceeds it will become obvious that the symptoms of breathlessness, præcordial pain, &c., were in some cases due to heart muscle infections, to gassing, and to other primary causes. As these patients were afflicted in exactly the same manner as were those in whom no immediate cause could be discovered, and as the treatment of the patients and the disposal of them depended on like factors in both groups, no attempt has been made to form subdivisions.

Organic Disease of the Heart.

There were 55 cases of organic disease of the heart, in which are included 3 cases of paroxysmal tachycardia (Table II). Table III. shows an analysis of 1000 cases which had been sent to the base with a diagnosis of some derangement of the cardiovascular system. 169 had been

TABLE II.—*"V.D.H." and "R.F" (Rheumatic Fever).*

—	No.	R.F.	No R.F.
Aortic regurgitation	11	6	5
Mitral stenosis	17	10	7
Mitral incompetence	19	11	8
Mitral stenosis and aortic regurgitation	5	4	1
Paroxysmal tachycardia	3	0	3
Total	55	31 (56·3%)	24 (43·7%)

TABLE III.—*Diagnosis sent in 1000 Cases which were "D.A.H." or "V.D.H."*

D.A.H.	770
V.D.H.	169 (real figure is 55)
Cardio-vascular	61

sent with a frank diagnosis of valvular disease of the heart, though in only 55 cases was there any justification for such an opinion. The proneness to make a diagnosis of organic disease of the heart seems to be due to the misinterpretation of systolic murmurs heard in the region of the heart, and especially at the apex. If a systolic murmur in the region of the apex is due to a leak at the mitral valve, there is almost invariably an alteration in the size of the heart, in the position of the apex beat, and in the intensity of the pulmonary second sound. As a practical guide, it may be asserted that a systolic murmur without the accompanying evidences of dilatation and hypertrophy of the heart can be disregarded.

The so-called functional murmurs have frequently certain features which distinguish them from murmurs associated with valvular incompetence. Functional murmurs appear and disappear from day to day and even from hour to hour. They are modified or disappear with alterations of posture; they are rendered inaudible by firm pressure on the ribs and interspaces with the fingers or with the bell of the stethoscope; they alter in character with the varying phases of respiration. But the most important criterion rests in the presence, or otherwise, of increase in the size of the heart. If there is no evidence of displacement of the apex beat the presence of a systolic murmur may be ignored.

Table II. shows that 56·3 per cent. of the patients with obvious valvular disease of the heart had suffered from rheumatic fever. It may be here remarked that no history of rheumatic fever was ever accepted unless there was a history of an illness associated with swellings of the joints which confined the patients to bed for six to seven weeks at least.

Disposal of cases of V.D.H.—I think it is obvious that patients with valvular disease in whom there is a history of rheumatic fever are not suitable for the exigencies of foreign service. Such patients have frequently had attacks of acute or subacute rheumatic fever on service. It is unfair to the Army and to themselves to continue their service, and all these cases have been sent to a board with a recommendation that they should be transferred to England.

Disordered Action of the Heart.

At the first examination those cases are disposed of who are found to be suffering from some disease which has no relation to the circulatory system, as well as those who are suffering from frank organic disease of the heart. There remain those who suffer from shortness of breath, pain in the chest, palpitation, and giddiness. As it has previously been pointed out, no clinical entity is claimed for this class of patient. Many different conditions give rise to the symptoms, and the underlying disease may be easily diagnosed, as for example in the cases of 83 patients who were excluded altogether from this category on the first examination. This train of symptoms may occur during convalescence from infectious diseases, such as typhoid fever and trench fever, in which there may be a pathological basis in the heart muscle. The same symptoms may arise after a particular shock or a series of shocks to the central nervous system, as the histories of these patients so often make clear, in whom there is no probability of heart muscle affection. The two classes of patients are indistinguishable, except in so far as there is a difference in the agent producing the symptoms. In many the contributory causes at onset are uncertain—the symptoms arise insidiously without any particular cause.

Therefore, it is impossible to classify patients suffering from D.A.H., and the detailed account of 1000 cases embraces all those who complained of shortness of breath, pain in the chest, palpitation and giddiness, in whom there were none of the recognised or recognisable maladies. In some cases it was apparent that the symptoms were only incidental to convalescence in an infectious disease, in some the symptoms had occurred throughout life on exertion, while in others the nerve-racking conditions of life in the trenches seemed to be the determining factor in the production of cardiac distress.

All the following tables have been based upon a study of 1000 cases, in whom there was no discoverable disease.

Table IV. shows the incidence of the main symptoms and of præcordial tenderness in 1000 cases. They represent the voluntary statements of the patients and not the result of inquiry by leading questions.

TABLE IV.—*1000 Cases of "D.A.H.": Summary of Symptoms.*

Symptoms.	Number.	Percentage.
Pain in chest	768	76·8
Breathlessness	675	67·5
Giddiness	403	40·3
Palpitation	354	35·4
Fainting (*a*) unconscious	98	9·8
,, (*b*) conscious	25	2·5
Præcordial tenderness	268	26·8
	Fit, 144. Unfit, 116.	

1. *Pain in Left Side of the Chest.*

768 patients complained of pain in the region of the heart, and the position and character of the pain varied considerably.

The position.—The pain was more frequently localised to the region of the apex and to an area extending from a hand's breadth below the apex than to any other part of the left chest. At times the pain was localised in the region of the third left interspace, and occasionally it radiated from one spot in the region of the heart to a wide area on the left side, sometimes also overflowing to the right side of the chest. Very rarely the pain radiated down the left arm and even less frequently down both arms. Such a distribution, especially in men over 40 years of age, led to the formation of a careful prognosis and the "boarding" of the patient.

The character.—A sharp stabbing pain was the description most frequently given; it was usually determined by exertion, causing alarm and cessation from work. This pain hampers the breathing and may be accompanied by a sensation of choking in the throat. After the acute pain has abated a varying area of the left chest remains sore.

A study of the histories shows that the first attack of pain is usually determined by some effort or often some sudden mental disturbance and that as further strains—physical and mental—are superadded, the attacks of pain become more frequent and last longer until it may be constant for two or three hours. Complaint is frequently made that pain in the chest prevents sleep and that lying on the left side in bed is an impossibility.

It is a curious fact that when pain in the heart has followed a mental shock some interval of time elapses before the pain is felt in the chest, though the heart may palpitate at the moment of shock. It is probable that the pain is the result of the over-excitability and overaction of the heart.

2. *Shortness of Breath.*

675 patients, or 67·5 per cent., complained of shortness of breath on slight exertion. Though on inquiry the remaining 32·5 per cent. of patients acknowledged that they were short of breath it was not a noteworthy feature.

Various forms of dyspnœa were noted which had obviously a neurotic origin. A very common type is that in which the breathing is rapid

and shallow—a type seen in civil practice in frank cases of hysteria. I have not taken graphic records of this form of dyspnœa, but I have frequently counted the respiratory rate at 60–80 per minute. Attacks of breathlessness occur at night, necessitating the assumption of an orthopnœic position. "Sighing" breathing is also common. The majority of sufferers from "D.A.H." show no increased respiratory rate at rest, but they are more breathless than normal individuals after the same amount of exertion.

3. *Giddiness.*

403 patients made giddiness a chief subject of complaint. It sometimes occurs with exertion, but more frequently on the resumption of the erect posture after sitting or after recumbency. Occasionally it is sufficiently severe to cause the individual to fall. Giddiness is a common complaint after Swedish drill, and certain exercises in particular seem to elicit it—namely, rising to the feet after the completion of leg movements while lying on the back. It is at times troublesome at night, and keeps the patient awake.

4. *Palpitation.*

Not all patients with rapid heart action are conscious of discomfort; 364, or 35·4 per cent., complained of "palpitation," "fluttering of the heart," "heavy beating" of the heart, and so forth. Palpitation usually occurs in attacks, and the rate of the heart during an attack may reach 180 beats per minute. The attacks may last for 5–6 hours or they may only continue for 20–30 minutes. Many graphic records have been taken during attacks of palpitation and the records in most instances show a normal rhythm of the heart during the attack with a gradual slowing of the heart-rate as the attack passes off. The histories of the attacks have at times suggested that the tachycardia was a true paroxysmal tachycardia and on six occasions polygraphic records have been obtained of this form of arrhythmia. In all instances the onsets and the terminations of the attacks were abrupt. It is probable that the nature of these tachycardias would have been overlooked had it not been for the fact that in many patients attacks of palpitation have been induced by exertion and graphic records have been taken in all of them.

5. *Fainting.*

123 patients stated that they were liable to "fainting attacks." It is frequently difficult to decide the nature of the attacks which patients describe as "faints." I have carefully inquired into the nature of these attacks, and the following statements seem justified. In some instances there seems no doubt that the faints are attacks of "petit mal." This opinion is supported by the previous history of similar attacks in civil life and in some instances by the occurrence of major epilepsy in childhood and youth.

Other attacks are more frankly syncopal in nature, and it has been noted that during the faint the pulse becomes both slow and weak. It will be seen in Table IV. that 98 patients asserted that consciousness was lost during the attacks and that it is retained in 25. The latter have usually stated that giddiness and a sensation of failure to see objects have compelled them to seek recumbency—a presyncopal state.

Attacks which are obviously hysterical are not included in this group and a history of this type of seizure is common.

6. *Exhaustion.*

Nearly every patient complains that he is now exhausted by degrees of physical exertion which he was previously well able to support. When this class of patient is taken into hospital it is with the greatest difficulty that they can be persuaded to keep away from their beds. The majority are content to rest on their beds, though when roused they are well able to get up the whole day and undergo physical drill and short marches with ease and with good effect.

7. *Nervous Phenomena.*

Headache is a common complaint, so also is sleeplessness. Many complain that they have been sleepless for some weeks previous to admission, and it has been found that large doses of bromide about an hour before bedtime is the best remedy. There is usually also an irritability of temper and a general feeling of dissatisfaction with themselves and the world at large. They are played out mentally and physically. Reference will be made to the neurasthenic manifestations later in the paper.

Physical Signs: (1) The Heart.

In all cases observations on the condition of the heart and circulatory system were made under the same headings. First it was ascertained if there was any tenderness of the chest wall and its position, if present, was noted. The rate was counted and any abnormality of rhythm or increase in size was recorded, and the character of the murmurs was described in detail.

(*a*) *Tenderness.*—268 out of 1000 cases of D.A.H. had tenderness of the parietes on the left side of the chest. The skin and muscles were tender on pressure and pinching. The tender area varies in size and distribution; the area which was found to be most commonly affected is that around the apex. A less common area involves the third and fourth ribs with the intervening interspace. At times the whole of the præcordial area is tender, together with marked tenderness of the left pectoral muscles. I have not been able to demonstrate any alterations of sensibility of the skin to light touch with cotton-wool. The degree of tenderness varies from time to time in the same individual. It is considered to be a bad prognostic sign if the tenderness continues throughout the treatment with exercises. In more than 50 per cent. of cases the tenderness disappears during treatment, and of 268 who had definite tenderness on admission 144 were returned as fit for their original duties. The degree of tenderness is a guide to the grade of exercise which the patient ought to undergo.

(*b*) *Rate.*—The rate is always counted before the patient is examined and after he has been quietly waiting in the room for a little time. It seemed a better guide to the usual frequency during the day to estimate the rate with the patient in the erect posture than to wait for a slower rate to ensue from recumbency. Many observations have been made on the rate of the heart under varying conditions of rest and activity. Asleep, the rate of the heart is comparatively slow in all cases—average 60–65 beats per minute.

Table V. shows that 46 per cent. fell within the figure 90–110 when the patient after a rest is in the erect posture, and 26 per cent. between the rates of 110–130. The average rate of the heart is usually increased and at times rates up to 160 beats per minute have been recorded.

In response to exercise the rate increases more than it does in normal individuals, and after slight exertion it is quite common to find the rate increased to 170–180 beats per minute. It is also a common experience that a longer interval of time elapses after exertion before the rate settles to its original rate, and this fact is of considerable prognostic value. It has been found that those patients do badly on the exercises in whom there is an interval of more than three minutes before the return of the rate to the pre-exercise figure.

TABLE V.—*Pulse-rates.*

Rate.	Percentage.	Rate.	Percentage.	Rate.	Percentage.
40–50	0·1	80–90	13·5	120–130	11·3
50–60	0·5	90–100	22·4	130–140	1·4
60–70	1·8	100–110	23·8	140–150	0·9
70–80	8·5	110–120	14·7	150–160	0·1

(*c*) *Rhythm.*—(1) *Sinus arrhythmia.* Though minor degrees of sinus arrhythmia were not noted, 48 cases showed gross irregularity of this type. (2) *Extrasystoles.* Premature contractions arising in the ventricles were noted in 57 patients. It was frequently observed that in patients with this type of irregularity the extrasystoles were frequent on admission to the camp, and that after 7–14 days there were considerably fewer per minute, and in most cases they completely disappeared before discharge from the camp. No other forms of irregularity were met with amongst the cases with D.A.H., although other types occurred in patients with organic disease of the heart.

(*d*) *Size.*—It is extremely difficult to detect minor differences in the size of the heart by percussion. In percussing the heart so many factors have to be taken into consideration, the chief of which is the presence of emphysema, small degrees of which will affect the accuracy of percussion.

In some cases of D.A.H. the apex of the heart is localised and at times forcible, and appears to be displaced downwards and outwards. The same type of heart is found amongst young workers in shipyards. Such hearts may be enlarged, but I have never found that they vary, at any rate during the time I have had them under observation (two months).

I have not therefore been able to detect any enlargement of the heart in this series of D.A.H. patients.

(*e*) *Sounds.*—Systolic murmurs were heard in 200 out of 500 cases in which special attention was given to their presence or absence. A murmur may only have been heard on one occasion, and that perhaps only after exertion. The importance of these murmurs without accompanying evidence of enlargement of the heart has already been referred to. It is only necessary to repeat that in most cases importance is not given to the presence of a murmur unless there is evidence of some enlargement of the heart with the following reservations. It is more difficult to detect small enlargements of the right side of the heart than of the left side, and at times a high-pitched, blowing systolic murmur limited to the tricuspid area is heard. This murmur is sometimes heard in emphysematous chests, and such patients are nearly always unfitted for hard physical labour. The same murmur may be heard in chests which seem to be normal in all other respects. At times this murmur, present on admission, disappears and does not return during the patient's sojourn at the camp.

Secondly, on rare occasions (6 out of 2500) a short musical squeaky murmur is heard at the apex and is poorly conducted. 50 per cent. of patients whose hearts present this murmur have suffered from rheumatic fever. In 2 cases it disappeared during the time the patient was in camp. If these murmurs disappear during a course of exercises, and the possessor of them shows no sign of cardiac embarrassment on exertion he is discharged fit. If the murmur persists and there is a history of rheumatic fever within recent years, discharge to England is recommended rather from the fear of further attacks of rheumatic fever than from the fear of causing damage to the heart by exertion.

2. *Blood Pressure.*

At first careful records were made of the systolic and diastolic blood pressures by the auscultatory method, and it was almost universally found that both were raised. Systolic pressures usually ranged from 135 to 150 mm. Hg and diastolic pressures from 90 to 110 mm. Hg. These pressures are certainly higher than those encountered in the same class of patient in the civil hospitals. Controls have not been made on the patients in the camp who are convalescent from wounds or general medical diseases, and until these are made it is impossible to attach importance to the high pressures in cases of D.A.H.

3. *Peripheral Cyanosis.*

Cold blue hands are frequently seen in this type of patient and many have been quite positive in their statement that the circulation in the hands was quite normal before the onset of other abnormal circulatory manifestations. In these cases local syncope frequently precedes the cyanosis constituting typical instances of Raynaud's disease.

4. *The Skin.*

The skin of these patients readily perspires and it is not uncommon to find patients becoming bathed in perspiration during examination.

5. *The Blood.*

No blood-counts have been done in this series of cases, though it is stated by Grace Briscoe that a leucocytosis occurs.[1]

6. *The Urine.*

No sugar or albumin is found; phosphatic deposits are common and the ease with which oxalate crystals are found microscopically is noteworthy.

7. *Nervous System.*

The physical evidences of derangement of the central nervous system are two in number. Firstly, tremulousness is particularly common, as well as are all the minor manifestations met with in cases of shell shock. Secondly, the knee-jerks are usually accentuated. The various subjective nervous phenomena have already been described, but it must not be assumed that all patients suffering from D.A.H. have these nervous manifestations. Many of them make no complaint of any symptom directly referable to the nervous system.

[1] THE LANCET, 1917, i., 832.

Such are the chief symptoms and physical signs met with in 5000 patients who have been put into the category of D.A.H., having no organic disease of the heart and no usually recognised disease.

Various incidental inquiries have been made in an endeavour to discover any facts which might be common to the group or by means of which this large motley group might be subdivided. The results of these inquiries and observations will now be stated.

Date of Onset of Symptoms.

Particular attention has been paid in each case to the date of the onset of the symptoms of which the patient at the moment complained. The first noteworthy point was the frequency with which the complaints of pains in the chest, breathlessness on slight exertion, &c., had been made in civil life. Thus, of 1000 cases the disability had been noticeable in 542 cases, and no complaint had been made before enlistment in 458 cases. Besides this broad division into the two groups of onset before and after enlistment an attempt was made to trace the onset to a particular factor. Tables VI. and VII. show the various conditions which were alleged to be the cause of the disability.

TABLE VI.—*1000 Cases of "D.A.H.": Onsets Before Enlistment.*

Attributed to—	Total No.	No. discharged fit.	Attributed to—	Total No.	No. discharged fit.
Indefinite gradual onset	307	191	Malaria	3	2
Rheumatic fever	82	40	Tonsillitis	2	1
Definite effort or shock	56	30	Asthma	2	1
Faints and fits	21	12	Jaundice	1	0
Pneumonia	18	9	Rarities	4	2
Typhoid fever	14	7	Onsets before enlistment	542	308
Scarlet fever	9	4	Onsets after enlistment	458	272
Influenza	9	1			
Pleurisy	6	6	—	1000	580
Rheumatism	4	1			
Diphtheria	3	1			

Table VI., before enlistment.—Out of a total of 542 cases in this group 56 attributed the onset of their symptoms to some definite effort and strain or to some sudden mental excitement and shock. Of the various infectious diseases rheumatic fever predominates, and 82 attributed the onset to this disease. These patients had no organic signs of disease of the heart. As the pathological process in rheumatic fever is the deposit of small inflammatory collections of cells in various parts of the muscles and valves, it is quite conceivable that an impaired muscle results without any deformation of the valves. Except rheumatic fever, pneumonia and typhoid fever claim more than any other infectious disease.

In early life either faints or fits had been associated with an inability to run about like other children in 21 cases; some of these patients had suffered from epilepsy or "petit mal." In 307 cases it was quite impossible to assign a definite onset either as regards time or disease.

TABLE VII.—*1000 Cases of "D.A.H.": Onsets After Enlistment.*

Attributed to—	Total No.	No. discharged fit.	Attributed to—	Total No.	No. discharged fit.
Indefinite, gradual	236	148	Rheumatic fever	3	0
Definite effort	57	26	Scarlet fever	2	0
Shell shock	36	20	Tonsillitis	2	2
P.U.O.	31	26	Jaundice	2	1
Buried	21	13	Rheumatism	2	0
Gassing	18	8	Measles (1)	2	2
Wounds	11	6	Pneumonia (1)		
Trench fever	8	6	Pleurisy (1)	2	2
Dysentery	8	3	Anæmia (1)		
Influenza?	6	6			
Fits and faints	5	1	—	458	272
Bronchitis	4	2			

Table VII., after enlistment.—Out of a total of 458 there were 236 who were unable to attribute the onset of their symptoms to any definite cause. Most stated that the exertion of training or of the additional strain, both mental and physical, required in France had gradually told upon them. More attributed the cause of their disability to their work in France than to their training in England, the former being the more strenuous. It must be remembered that many of those who break down in England during their training never reach France.

There are certain special factors peculiar to the conditions of active service in the field which cause or attribute to this train of symptoms—namely, wounds, gassing, being buried and shell shock. In the case of the wounded who later complained of circulatory disturbances there had usually been a prolonged period of sepsis which may have caused changes in the heart muscle, and must be regarded as a condition analogous to the condition of the heart following infectious fevers. The symptoms of D.A.H. followed "gassing" in 18 instances. Shell shock and burying account for 36 and 21 respectively. Of infectious causes influenza, dysentery, trench fever, and P.U.O. are the most frequent antecedents. Many giving a history of these diseases were barely convalescent from them on admission to the camp.

In both tables the number of patients who were discharged fit in each category has been noted, and it cannot be said that any apparent onset materially affects the prognosis. At the initiation of this inquiry it was thought that it might be possible to find that certain diseases affected the circulatory system in particular ways and produced certain definite results. Such, however, is not the case, and from a study of the onsets of the symptoms no help has been obtained in prognosis.

TABLE VIII.—*1000 Cases of "D.A.H."—Ages.*

Age.	Percentage (D.A.H.).	Percentage 2000 other cases.
15–20 years	7·9	11·15
20–25 ,,	33·3	32·96
25–30 ,,	23·1	22·05
30–35 ,,	13·8	13·05
35–40 ,,	10·9	11·55
40–45 ,,	8·4	7·5
Over 45 years	2·6	1·75
—	100·0	100·0

It seemed desirable to discover whether the symptoms of D.A.H. were prone to occur at any particular age, and Table VIII. shows the ages of 1000 cases grouped into periods of 5 years. 56·4 per cent. of cases were between 20 and 30 years of age. It seemed probable that the huge majority of men serving in France were of this age, and a similar table was compiled from the ages of 2000 patients who were not in D.A.H. companies. It is apparent that no deductions can be drawn from a study of the age incidence of the complaint, as the percentages in the quinquennial periods are almost identical in the two tables.

TABLE IX.—*Occupations of 1000 D.A.H. Cases.*

1. Light general labour: Servants, butchers, painters, and barmen	256 (25·6%)
2. Open-air labour: Labourers (55), farm hands (63), gardeners (26)	206 (20·6%)
3. Sedentary indoor work: Clerks (77)	178 (17·8%)
4. Industrial heavy labour: Miners (60), fitters, strikers, and turners (22)	152 (15·2%)
5. Industrial light labour: Engineers (20), mechanics (18), electricians (6)	125 (12·5%)
6. Army, Navy, Sea, &c.	54 (5·4%)
7. Indolent: Very easy; uncertain	29 (2·9%)

Civil occupations.—It has been difficult to decide upon a suitable and short classification of the employments upon which the patients were engaged previous to enlistment (Table IX.). In order to be able to draw correct conclusions from this table it would be necessary to compile a table from patients in camp not suffering from D.A.H. In the meantime it may be noted that the lighter classes of occupation provide the largest number of patients.

TABLE X.—*Arms of Service. Percentage.*

—	1000 heart cases.	1000 other medical cases.	Difference.	—	1000 heart cases.	1000 other medical cases.	Difference.
Infantry (Line)	57·1	48·5	8·6	R.F.C.	0·8	0·6	0·2
,, (Labour)	4·4	0·1	4·3	Other corps	0·9	0·3	0·6
Artillery	11·3	12·07	0·77	Canadians	3·9	3·6	0·3
Cavalry	0·9	1·0	0·1	Australians	5·1	14·7	9·6
Engineers	4·8	5·02	0·22	New Zealanders	2·8	6·01	3·21
A.S.C.	4·6	4·1	0·5	Other Colonials	0·3	0·2	0·1
M.G.C.	2·3	1·8	0·5				
R.A.M.C.	0·8	1·2	0·4	—	100·0	100·0	—

Arms of service.—Table X. shows the incidence of patients with D.A.H. and with other medical diseases in the various branches of the service. As far as British troops are concerned the separate arms of service are considered, but all branches of service are included in the figures of Colonial troops; it may be assumed that the same proportions fall into the different categories of service as in the case of British troops.

In this table there are three noteworthy facts: Firstly, the infantry afford a higher percentage of D.A.H., cases than of ordinary medical cases. Secondly, a larger number of individuals in labour companies go sick with D.A.H. than with the usual medical diseases. Thirdly, a considerably smaller number of Australian and New Zealand troops go sick with D.A.H. than with ordinary illnesses. This is particularly noticeable in the case of Australians, and the reason may lie in the fact that these troops are more carefully picked.

TABLE XI.—*Average Service in 1000 Cases of D.A.H.*

Total, average service	21 months.
In France, average service	9 ,,

Average Service.

The total average service was 21 months, and the average service in France was 9 months.

Incidence of Rheumatic Fever.

108 out of 1000 cases with D.A.H. had suffered from definite rheumatic fever—10·8 per cent. A history of rheumatic fever was only accepted if the patient had suffered from an illness lasting at least four weeks in which the joints had been swollen. None of these patients gave any evidence of valvular disease of the heart. Apart from causing valvular lesions it is quite possible that the organism of rheumatic fever may cause a permanently impaired heart trouble. Hence the frequency with which a previous history of rheumatic fever occurs in the subjects of D.A.H. symptoms.

Treatment.

It has been generally acknowledged that treatment in hospital is contraindicated in patients of this class. For a while they were collected into a separate hospital, and it was with the greatest difficulty that they could be kept out of their beds. An attempt was made at this hospital to give them exercises in the morning and a march in the afternoon. As the facilities for the organisation of exercises were insufficient, the patients were henceforth collected at the convalescent camp. The mornings are occupied by graduated exercises under the supervision of special instructors. It was found better to break the morning by giving shorter exercises at 9 A.M. and 11 A.M., rather than to occupy one more prolonged period. The men are less exhausted and the morning is better occupied. Games enter largely into the exercises.

In the afternoon all either take part in the camp march or the different grades are accompanied on a separate march by the medical officer in order that he may better form an opinion of their condition and progress.

The grades of exercises are three in number, and have been taken from the Army exercises. Grade 3 includes very easy standing exercises, and Grade 1 includes those required by the trained soldiers, while Grade 2 is intermediate in severity.

At the first examination each patient is put upon Grade 3, or he is given complete rest for a few days.

It has been found advisable to give certain patients a period of physical rest before the exercises are started, and these are put upon a fire picket for the first ten days. Each patient comes up for inspection once in five days, and the grade of exercise is advanced as improvement takes place. The average stay in the camp is 29·3 days, and before disposal each man who has been marked "Fit" has been at least ten days on Grade 1.

TABLE XII.—*1000 Cases of "D.A.H." : Disposal.*

Discharges.	Total.	Percentage.	Percentage in 500 cases.	Discharges.	Total.	Percentage.	Percentage in 500 cases.
Fit	580	58·0	59·0	England (unfit)	6	0·6	2·0
P.B. (ordinary)	172	17·2	—	Unknown ...	17	1·7	—
P.B. (light) ...	44	4·4	19·0	In camp	45	4·5	—
T.B.	86	8·6	16·0				
Hospital	50	5·0	4·0	—	1000	100·0	100·0

Table XII. shows the disposal of 1000 cases; 58 per cent. are returned to their original units as fit. Men aged 40 are not kept long in the camp, as it has not been found advisable to keep men of this age for long periods on graduated exercises. If they recover with rest and easy exercises they are returned to their units, but if they show no improvement in 7–10 days, or are otherwise unfit, they are usually marked "P.B." (Permanent Base). In order to discover the justification for our disposal, records of D.A.H. cases are sent weekly from the other bases.

At our base an endeavour has been made to get as many men as possible back to work, and as none of them suffer from any organic disease no real hardship is inflicted on the individual. Economic conditions would seem to compel the Army to act on this principle. Many of those who come down the line with D.A.H. symptoms are of poor nervous stability, and almost certainly complain too readily. Our object at the first examination and throughout his sojourn in the camp is to restore the confidence of the patient in himself, and particularly in the condition of the heart.

Any cardiac sensation, such as pain and palpitation, always causes alarm, and it has to be continually brought home to the patient that he has no disease which is going to impair his health or shorten his days.

As in the case of neurasthenics, much can be done by personal influence, and for this reason the medical officers attend the exercises and accompany the men on their afternoon march. By encouragement and simple explanations of their symptoms much good can be achieved in re-establishing the patient's confidence and creating a desire to see things in a proper perspective. The sergeant-majors of the companies are carefully selected; they are able to give valuable information to the medical officers concerning the daily condition of the men under their charge, and they are expected to exert an encouraging influence on the men themselves. Once a man has been brought to realise that there is nothing seriously amiss with his heart recovery takes place more rapidly.

History.

The condition of soldier's heart—irritable heart, &c.—has been described in previous wars. There is something associated with the physical and mental effects of warfare which conduces to the production of the symptoms of D.A.H., as described in this paper. We do not meet with the condition in civil practice to anything like the same extent.

From 1864 to 1868 a committee sat under the chairmanship of Earl de Grey to inquire into the condition of "soldier's heart" in the British Army. It was then thought to be due to the nature of the accoutrements which the soldiers had to carry at that time, and certain changes were made in them.

Large numbers of cases occurred during the American Civil War, and in 1864 the condition was thought to be due to long-continued overexertion, little sleep, and poor nourishment.

In 1871 Da Costa gave an account of 300 cases, and his description embraces nearly all the clinical features as we know them to-day. From 1876 to 1896 various authors ascribed the condition in the British Army to the "setting-up" drill in vogue.

No satisfactory explanation of soldier's heart has yet been offered, and although much attention has been paid to the condition in this war it cannot be said that we know much more about the mechanism by which the symptoms are produced than was known 50 years ago.

Theories of Causation.

During this war various theories have been advanced to account for the condition, to which brief reference may be made.

1. *The Ductless Glands.*

The two glands which have been chiefly incriminated are the thyroid gland and the suprarenal gland.

(*a*) *The thyroid gland.*—Hyper-excitability of the nervous system, tremors, tachycardia, and a proneness to sweating and flushing are common in Graves's disease and in the soldier's heart. But they also occur under quite other conditions, being merely evidences of overaction of the sympathetic nervous system. In support of the theory that the soldier's heart is due to a hyperthyroidism it has been asserted that the gland is frequently enlarged in patients with D.A.H. The condition of the neck has always been noted in our patients, but the gland has only rarely been found to be enlarged. This observation is in keeping with the statement that the thyroid gland was only palpably enlarged in 4 per cent. of the cases with D.A.H. at the Hampstead Hospital.

If the condition of D.A.H. was in many cases a mild form of Graves's disease we should expect that some of the more serious examples of it (D.A.H.) would develop into a readily recognised form of exophthalmic goitre. Such a development has never been observed.

A point of distinction of some importance seems to lie in the fact that the rate of the heart in D.A.H. becomes normal (60–70) during sleep. It has been observed in many cases of exophthalmic goitre that the rate of the heart remains fast during sleep, but special observations have not been made to ascertain this point.

(*b*) *The adrenal gland.*—Both excessive and diminished secretion have been alleged to be a cause of D.A.H. The high blood pressure found in cases of D.A.H. suggests an increased flow of adrenal secretion. The other evidences of overactivity of the sympathetic nervous system lend support to this view.

Patients suffering from Graves's disease less readily tolerate the effects of the artificial injection of the thyroid gland than do normal persons. On the same analogy it was anticipated that sufferers from D.A.H. would less readily tolerate intravenous injections of adrenalin chloride if the condition was due to an excessive secretion of the adrenal gland.

A number of experiments were performed on D.A.H. patients and controls in order to discover if any hypersensitiveness to adrenalin chloride existed in those suffering from D.A.H.

Doses varying from ½ to 2½ minims of a 1 in 1000 solution of adrenalin chloride were injected into the median basilic veins of both patients and controls. It was thought advisable to try the reaction both to a dose which would produce definite effects and to a small dose which bordered on the threshold of excitability.

Five controls and 12 patients were investigated in this way.

	Increase of blood pressure.	Increase in rate.
Controls	38	29
Patients	32	25

No deductions can be drawn from these figures as there is considerable individual variation in the two groups. The patients were more conscious of subjective sensations than were the controls, and made more complaint of palpitation, giddiness, and tingling in the limbs. Pallor was of the same intensity in the two groups.

2. *Infectious Theory.*

Shortness of breath, palpitation, giddiness, and even pain in the neighbourhood of the heart occur during convalescence after an infectious disease. After influenza, typhoid fever, and almost any pyrexial condition these symptoms persist for a variable period. The immediate antecedent history of a pyrexial disease in our cases suggests this origin in some of them. It has been found that some still have short periods of fever after admission to the convalescent camp, and this class of patient even after the absolute return of the temperature to normal does better with a period of rest before the exercises are commenced.

The relationship between the onset of the cardiac symptoms and the infective condition may not always be so obvious. Residual abscesses from wounds causing in themselves little inconvenience have been found to give rise to intoxication producing the picture of D.A.H. Small collections of pus in deep wounds of the leg and small collections round foreign bodies in the pleural cavity have been the immediate cause of the more general symptoms of shortness of breath, palpitation, and pain in the region of the heart on exertion. The opening and draining of the abscess has led to the complete disappearance of the symptoms. This inquiry has brought to light the malign effects of rheumatic fever on the heart muscle apart from the production of valvular disease. The results of the different inquiries place the incidence of rheumatic fever in the previous history of the patient at 11–23 per cent. of all cases. It is almost certain that 20 per cent. represents the incidence of rheumatic fever in D.A.H. patients more nearly than a lower figure. From this fact it must be assumed that the micro-organism of rheumatic fever causes permanent damage to the heart muscle.

The fact that in many patients there is a polymorphonuclear leucocytosis makes it probable that there are other infective agents which are more difficult to recognise.

3. *Toxæmic Theory.*

It has been suggested that the products of faulty metabolism, engendered possibly by an infective process, cause the symptoms. In support of this theory it is alleged that the breathlessness in some cases is due to a hyperacidity of the blood. Exercise causes an increased acidity of the blood which is normally neutralised by a combination of the acid with sodium bicarbonate, sodium phosphate, and protein. Unless the hyperacid condition of the blood were in this way controlled

Such are the chief symptoms and physical signs met with in 5000 patients who have been put into the category of D.A.H., having no organic disease of the heart and no usually recognised disease.

Various incidental inquiries have been made in an endeavour to discover any facts which might be common to the group or by means of which this large motley group might be subdivided. The results of these inquiries and observations will now be stated.

Date of Onset of Symptoms.

Particular attention has been paid in each case to the date of the onset of the symptoms of which the patient at the moment complained. The first noteworthy point was the frequency with which the complaints of pains in the chest, breathlessness on slight exertion, &c., had been made in civil life. Thus, of 1000 cases the disability had been noticeable in 542 cases, and no complaint had been made before enlistment in 458 cases. Besides this broad division into the two groups of onset before and after enlistment an attempt was made to trace the onset to a particular factor. Tables VI. and VII. show the various conditions which were alleged to be the cause of the disability.

TABLE VI.—*1000 Cases of "D.A.H.": Onsets Before Enlistment.*

Attributed to—	Total No.	No. discharged fit.
Indefinite gradual onset	307	191
Rheumatic fever	82	40
Definite effort or shock	56	30
Faints and fits	21	12
Pneumonia	18	9
Typhoid fever	14	7
Scarlet fever	9	4
Influenza	9	1
Pleurisy	6	6
Rheumatism	4	1
Diphtheria	3	1
Malaria	3	2
Tonsillitis	2	1
Asthma	2	1
Jaundice	1	0
Rarities	4	2
Onsets before enlistment	542	308
Onsets after enlistment	458	272
—	1000	580

Table VI., before enlistment.—Out of a total of 542 cases in this group 56 attributed the onset of their symptoms to some definite effort and strain or to some sudden mental excitement and shock. Of the various infectious diseases rheumatic fever predominates, and 82 attributed the onset to this disease. These patients had no organic signs of disease of the heart. As the pathological process in rheumatic fever is the deposit of small inflammatory collections of cells in various parts of the muscles and valves, it is quite conceivable that an impaired muscle results without any deformation of the valves. Except rheumatic fever, pneumonia and typhoid fever claim more than any other infectious disease.

In early life either faints or fits had been associated with an inability to run about like other children in 21 cases; some of these patients had suffered from epilepsy or "petit mal." In 307 cases it was quite impossible to assign a definite onset either as regards time or disease.

TABLE VII.—*1000 Cases of "D.A.H.": Onsets After Enlistment.*

Attributed to—	Total No.	No. discharged fit.
Indefinite, gradual	236	148
Definite effort	57	26
Shell shock	36	20
P.U.O.	31	26
Buried	21	13
Gassing	18	8
Wounds	11	6
Trench fever	8	6
Dysentery	8	3
Influenza	6	6
Fits and faints	5	1
Bronchitis	4	2
Rheumatic fever	3	0
Scarlet fever	2	2
Tonsillitis	2	1
Jaundice	2	0
Rheumatism	2	0
Measles (1)	2	2
Pneumonia (1)		
Pleurisy (1)	2	2
Anæmia (1)		
—	458	272

Table VII., after enlistment.—Out of a total of 458 there were 236 who were unable to attribute the onset of their symptoms to any definite cause. Most stated that the exertion of training or of the additional strain, both mental and physical, required in France had gradually told upon them. More attributed the cause of their disability to their work in France than to their training in England, the former being the more strenuous. It must be remembered that many of those who break down in England during their training never reach France.

There are certain special factors peculiar to the conditions of active service in the field which cause or attribute to this train of symptoms—namely, wounds, gassing, being buried and shell shock. In the case of the wounded who later complained of circulatory disturbances there had usually been a prolonged period of sepsis which may have caused changes in the heart muscle, and must be regarded as a condition analogous to the condition of the heart following infectious fevers. The symptoms of D.A.H. followed "gassing" in 18 instances. Shell shock and burying account for 36 and 21 respectively. Of infectious causes influenza, dysentery, trench fever, and P.U.O. are the most frequent antecedents. Many giving a history of these diseases were barely convalescent from them on admission to the camp.

In both tables the number of patients who were discharged fit in each category has been noted, and it cannot be said that any apparent onset materially affects the prognosis. At the initiation of this inquiry it was thought that it might be possible to find that certain diseases affected the circulatory system in particular ways and produced certain definite results. Such, however, is not the case, and from a study of the onsets of the symptoms no help has been obtained in prognosis.

TABLE VIII.—*1000 Cases of "D.A.H."—Ages.*

Age.	Percentage (D.A.H.).	Percentage 2000 other cases.
15-20 years	7·9	11·15
20-25 ,,	33·3	32·96
25-30 ,,	23·1	22·05
30-35 ,,	13·8	13·05
35-40 ,,	10·9	11·55
40-45 ,,	8·4	7·5
Over 45 years	2·6	1·75
—	100·0	100·0

It seemed desirable to discover whether the symptoms of D.A.H. were prone to occur at any particular age, and Table VIII. shows the ages of 1000 cases grouped into periods of 5 years. 56·4 per cent. of cases were between 20 and 30 years of age. It seemed probable that the huge majority of men serving in France were of this age, and a similar table was compiled from the ages of 2000 patients who were not in D.A.H. companies. It is apparent that no deductions can be drawn from a study of the age incidence of the complaint, as the percentages in the quinquennial periods are almost identical in the two tables.

TABLE IX.—*Occupations of 1000 D.A.H. Cases.*

1. Light general labour: Servants, butchers, painters, and barmen	256 (25·6%)
2. Open-air labour: Labourers (55), farm hands (63), gardeners (26)	206 (20·6%)
3. Sedentary indoor work: Clerks (77)	178 (17·8%)
4. Industrial heavy labour: Miners (60), fitters, strikers, and turners (22)	152 (15·2%)
5. Industrial light labour: Engineers (20), mechanics (18), electricians (6)	125 (12·5%)
6. Army, Navy, Sea, &c.	54 (5·4%)
7. Indolent: Very easy; uncertain	29 (2·9%)

Civil occupations.—It has been difficult to decide upon a suitable and short classification of the employments upon which the patients were engaged previous to enlistment (Table IX.). In order to be able to draw correct conclusions from this table it would be necessary to compile a table from patients in camp not suffering from D.A.H. In the meantime it may be noted that the lighter classes of occupation provide the largest number of patients.

TABLE X.—*Arms of Service. Percentage.*

—	1000 heart cases.	1000 other medical cases.	Difference.	—	1000 heart cases.	1000 other medical cases.	Difference.
Infantry (Line)	57·1	48·5	8·6	R.F.C.	0·8	0·6	0·2
,, (Labour)	4·4	0·1	4·3	Other corps	0·9	0·3	0·6
Artillery	11·3	12·07	0·77	Canadians	3·9	3·6	0·3
Cavalry	0·9	1·0	0·1	Australians	5·1	14·7	9·6
Engineers	4·8	5·02	0·22	New Zealanders	2·8	6·01	3·21
A.S.C.	4·6	4·1	0·5	Other Colonials	0·3	0·2	0·1
M.G.C.	2·3	1·8	0·5				
R.A.M.C.	0·8	1·2	0·4	—	100·0	100·0	—

Arms of service.—Table X. shows the incidence of patients with D.A.H. and with other medical diseases in the various branches of the service. As far as British troops are concerned the separate arms of service are considered, but all branches of service are included in the figures of Colonial troops; it may be assumed that the same proportions fall into the different categories of service as in the case of British troops.

In this table there are three noteworthy facts: Firstly, the infantry afford a higher percentage of D.A.H., cases than of ordinary medical cases. Secondly, a larger number of individuals in labour companies go sick with D.A.H. than with the usual medical diseases. Thirdly, a considerably smaller number of Australian and New Zealand troops go sick with D.A.H. than with ordinary illnesses. This is particularly noticeable in the case of Australians, and the reason may lie in the fact that these troops are more carefully picked.

TABLE XI.—*Average Service in 1000 Cases of D.A.H.*

Total, average service	21 months.
In France, average service	9 ,,

Average Service.

The total average service was 21 months, and the average service in France was 9 months.

Incidence of Rheumatic Fever.

108 out of 1000 cases with D.A.H. had suffered from definite rheumatic fever—10·8 per cent. A history of rheumatic fever was only accepted if the patient had suffered from an illness lasting at least four weeks in which the joints had been swollen. None of these patients gave any evidence of valvular disease of the heart. Apart from causing valvular lesions it is quite possible that the organism of rheumatic fever may cause a permanently impaired heart trouble. Hence the frequency with which a previous history of rheumatic fever occurs in the subjects of D.A.H. symptoms.

Treatment.

It has been generally acknowledged that treatment in hospital is contraindicated in patients of this class. For a while they were collected into a separate hospital, and it was with the greatest difficulty that they could be kept out of their beds. An attempt was made at this hospital to give them exercises in the morning and a march in the afternoon. As the facilities for the organisation of exercises were insufficient, the patients were henceforth collected at the convalescent camp. The mornings are occupied by graduated exercises under the supervision of special instructors. It was found better to break the morning by giving shorter exercises at 9 A.M. and 11 A.M., rather than to occupy one more prolonged period. The men are less exhausted and the morning is better occupied. Games enter largely into the exercises.

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The grades of exercises are three in number, and have been taken from the Army exercises. Grade 3 includes very easy standing exercises, and Grade 1 includes those required by the trained soldiers, while Grade 2 is intermediate in severity.

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TABLE XII.—*1000 Cases of "D.A.H." : Disposal.*

Discharges.	Total.	Percentage.	Percentage in 500 cases.	Discharges.	Total.	Percentage.	Percentage in 500 cases.
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Table XII. shows the disposal of 1000 cases; 58 per cent. are returned to their original units as fit. Men aged 40 are not kept long in the camp, as it has not been found advisable to keep men of this age for long periods on graduated exercises. If they recover with rest and easy exercises they are returned to their units, but if they show no improvement in 7–10 days, or are otherwise unfit, they are usually marked "P.B." (Permanent Base). In order to discover the justification for our disposal, records of D.A.H. cases are sent weekly from the other bases.

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Any cardiac sensation, such as pain and palpitation, always causes alarm, and it has to be continually brought home to the patient that he has no disease which is going to impair his health or shorten his days.

As in the case of neurasthenics, much can be done by personal influence, and for this reason the medical officers attend the exercises and accompany the men on their afternoon march. By encouragement and simple explanations of their symptoms much good can be achieved in re-establishing the patient's confidence and creating a desire to see things in a proper perspective. The sergeant-majors of the companies are carefully selected; they are able to give valuable information to the medical officers concerning the daily condition of the men under their charge, and they are expected to exert an encouraging influence on the men themselves. Once a man has been brought to realise that there is nothing seriously amiss with his heart recovery takes place more rapidly.

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If the condition of D.A.H. was in many cases a mild form of Graves's disease we should expect that some of the more serious examples of it (D.A.H.) would develop into a readily recognised form of exophthalmic goitre. Such a development has never been observed.

A point of distinction of some importance seems to lie in the fact that the rate of the heart in D.A.H. becomes normal (60–70) during sleep. It has been observed in many cases of exophthalmic goitre that the rate of the heart remains fast during sleep, but special observations have not been made to ascertain this point.

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the result would be an excessive stimulation of the respiratory centre by excess of acid.

It has been shown by Lewis, Barcroft, and others that there is a lack of compensating salts in some patients of this type, and they would explain the breathlessness in these patients as due to a lack of compensatory or "buffer" salts.

This is an interesting observation, and though it may account for the breathlessness in some cases, it in no way explains the prime cause of the affection.

4. *The Nervous Theory.*

It has been asserted that the cardiac manifestations are those commonly met with in neurasthenia. Some patients who complain of the symptom-group of D.A.H. are undoubtedly neurasthenics. Many reveal the stigmata and phobias commonly met with in neurasthenia, and the knee-jerks are usually active.

Very many sufferers from D.A.H. are in no way neurasthenic. I have carefully inquired into the previous history of many, and am quite confident that neurasthenia does not account for the symptoms in many of our patients, not even if we assume that every one is a potential neurasthenic. The majority of men who have served for any length of time in the trenches have exhausted nervous systems. Prolonged mental and physical strain, together with insufficient sleep, gradually wear down the individual. He becomes hypersensitive and less resistant to peripheral impulses, and will be more readily affected by discomfort than he was previously. This discomfort may be mental or physical. The excessive beating of the heart which must frequently occur as the result of shock may by repetition become constant. In this manner a habit of tachycardia is produced which becomes intolerable to the individual whose nervous resistance is already lowered.

In some who feel discomfort on exertion there is no evidence at all of an unbalanced nervous system, and the neurasthenic theory cannot be applied to all cases.

Conclusions.

The symptoms of shortness of breath, pain in the region of the heart, palpitation, and giddiness occur under varying states of the body and mind. We are unable to assign a definite pathological basis to the majority of cases. There is no single underlying cause to account for the occurrence of the symptom-group entitled D.A.H. or the soldier's heart.

Firstly, there are those who throughout life have been unable to undergo physical exertion of any sort. The possibility of muscular development varies enormously in individuals. One man by exercise can increase the size of his biceps enormously, whilst another by training and exercise is unable to reach anything like the same degree of development. As there is this inherent difference in the potentiality of the skeletal musculature, it seems reasonable to suppose that the heart muscle varies likewise in its power to respond to abnormal and excessive calls upon its adaptability. Some boys are unable to run about like their fellows without becoming immediately "out of breath." There is no doubt that careful and graduated training will improve the "wind" of this type to some extent, but the majority are never fit for great and prolonged physical exertion.

Secondly, some D.A.H. cases owe their disability to permanent or temporary damage to the heart muscle. Reference has already been made to the high incidence of rheumatic fever in our cases—10·8 per cent.—and in the case of other observers—20 per cent. Into the same category fall many who are convalescent from infectious diseases—namely, the enteric group of fevers, influenza, and trench fever.

Thirdly, in the tachycardia following shell shock and in neurasthenics the fault lies in the nervous innervation of the heart rather than in the heart muscle itself. However the condition may be produced, the rationale of treatment is the same in all cases. The most important factor in all cases is the abolition from the patient's mind of the idea that he has a diseased heart. After careful inquiry into the history and examination of the heart he must be confidently told that he has no heart disease and that he must be encouraged to ignore the uncomfortable sensations produced by exertion. This re-establishment of confidence is much helped by the method of graduated exercises, and the day must be wholly occupied, so that there are no long periods of sitting about the camp with opportunities of introspection. Good food, undisturbed sleep and outdoor exercise, regulated and under discipline, are the sole factors necessary for the improvement of all types.

By this method 50–60 per cent. can be sent back to their original work after 4–5 weeks. The remaining 40–50 per cent. are unable by reason of poor physique, actual disease, or of age to undertake every kind of work and hardship. Apart from those who suffer from actual heart disease or some organic disease of other systems, nearly all are fit for some service in France. It would be of great advantage to the individual and to the Army if those who are considered to be unfit for general service could be allotted the work for which they are mentally and physically fit.

I have much pleasure in acknowledging my debt to the following. To Colonel Sir Bertrand Dawson, K.C.V.O., C.B., A.M.S., for much advice and assistance in the administration of the scheme; to Surgeon-General R. H. S. Sawyer, C.M.G., D.D.M.S., for granting me facilities for the collection and examination of the cases, thereby instituting the scheme in the base under his command; to Lieutenant-Colonel J. H. Campbell, D.S.O., R.A.M.C., for his constant courtesy and assistance in administering the companies in his camp; to Captain P. Warburton and Captain J. A. Venning for their help in the daily routine of work in the camp; and to the sergeant-majors who drilled and had charge of our patients.

DELAYED PRIMARY SUTURE OF WOUNDS.

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AND
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EARLY and thorough resection of wounds is now universally recognised as the great prophylactic against sepsis. The term "delayed primary suture" we have applied to all cases of suture performed in the first five days after infliction of wound, with the exception of those closed at the preliminary cleansing operation. Perhaps the decision is a very arbitrary one. The chief factor in choosing the fifth day has been the desire to exclude all cases in which the body has developed its natural defences and overcome an established infection. We were anxious to draw attention to that considerable class of case in which primary suture is delayed, not so much to allow of the treatment of sepsis as to make reasonably sure that serious infection has been avoided. It is a suture performed before the full development of granulation tissue and before complete establishment of the natural defences of the body by active immunisation.

Description of Method.

Seriously wounded patients arrive at this hospital as a rule in the middle of the night and from 36 hours to three days after being hit. They are, if possible, made comfortable, lightly fed, and encouraged to sleep. Next morning men and wounds are carefully examined. All wounds are "X rayed" if there is any suspicion of a foreign body being still present. If temperature is not rising and pulse-rate satisfactory a moderate degree of fever is no contra-indication to suture at this stage. The wound, however, must be free from all suppuration and from all clinical evidence of infection. Great swelling, especially in cases of fracture, may be caused by the trauma alone, and is quite compatible with a low degree of infection or even with a wound sterile on culture. A characteristic appearance of some of the very best wounds is a surface covered by a thin layer of perfectly clear coagulated lymph.

Now, granted that all the clinical signs are favourable, it is absolutely essential to proceed to still more stringent tests, for in such wounds—unlike those in the stage when granulation tissue is well developed—favourable clinical appearances are quite apt to be associated with a degree of infection which in our experience does not admit of safe suture. We find the only reliable plan is to make numerous smears by platinum loops passed into every suspicious nook and cranny of the wound, not forgetting the skin edges. These are examined in the way that Carrel has laid down. This microscopical examination of films has been a very safe and ready guide. Cultures have also been made, but the evidence so obtained is still too complex to admit of useful analysis. On the other hand, if not more than one organism, bacillus or coccus, is present in any one film of the microscope, or one diplococcus in three, suture can be successfully practised, and if a similar examination the following morning yields equally satisfactory results the operation is carried out.

The simplest technique is employed. No antiseptic is used (except in cases already treated with Bipp, where a small additional quantity may be introduced). Every attention is paid to accurate apposition of skin edges and to obliteration of dead spaces. No drainage is required, and the only point to insist on is the necessity for asepsis and very careful cleansing of skin, the wound meanwhile protected by a thick swab. The whole area is finally dried with ether and the skin painted with iodine. The cases in which

the dressings need be touched before the seventh day are very few, and at that dressing, as a rule, every second stitch is removed, the remainder being cut on the tenth day.

Analysis of Cases.

Of 290 consecutive gunshot cases during the past six months, 36 were sutured within five days of being wounded. Five of these were not up to suture standard and were closed tentatively. The remaining 31 cases—10·7 per cent. of whole series—arrived at the base up to suture standard.

Of the 36 cases sutured, 16 had wounds of soft parts only, 13 complete fractures of long bones, 5 partial fractures, and 2 wounds of joints. The proportion of wounds of soft parts to other wounds is a little greater in those sutured than in the whole series, and this is not surprising considering the relative ease with which wounds of soft parts can be completely excised.

Of the 36 cases, 29 had been wounded by shell, 2 by shrapnel ball, and 5 by bullet. Those who have been less enthusiastic with regard to the free excision of wounds have suggested that many of the surgically clean wounds arriving at the base were bullet wounds which would have healed quietly without surgical intervention. The above figures do not bear this out.

Although the majority of cases had been treated by the Carrel-Dakin method, a few had been freely excised and then treated with Bipp, flavine, or soap.

Results of Suture.

Of the 31 cases up to suture standard when closed 28 made a perfect recovery, being healed on an average of 10·5 days from the date of suture. The remaining three cases were partially successful.

In one case of compound fracture of scapula, treated with Bipp, there was great physical difficulty in closing wound. Several of the sutures gradually cut out and left a wound about half original size.

A second case with compound fracture of tibia and fibula also presented difficulties when the question of closure arose. In spite of considerable undercutting there was great tension in one of the wounds and several stitches gave. Both these cases serve to illustrate the importance of conserving as much skin as possible in the primary excision.

The third case was one of compound fracture of tibia. For no obvious reason the extremity of one wound opened after removal of stitches on twelfth day.

In no case was there any constitutional disturbance nor any local signs of inflammation.

The five cases not up to suture standard all looked clean to the naked eye and presented low bacterial counts. Only one was really successful and this was healed on the fifteenth day after suture. In three cases there was partial success, the wounds being healed respectively in three, five, and seven weeks. In one case there was lighting up of infection with marked general reaction and all the sutures had to be removed.

It is thus seen that Carrel's bacteriological standard was of the greatest value in the choice of wounds for delayed primary suture. It is rapid and easily carried out with the simplest laboratory equipment.

Cultures were made to determine the micro-organisms present in the sutured wound. Aerobic cultures in broth and on agar slopes and anaerobic cultures were taken, and in special cases the organisms were isolated and subcultured. A great diversity of bacteria was encountered—staphylococci, streptococci, Gram + and Gram − bacilli, diphtheroids, and others occurred either singly or in various combinations. In a small series of observations with such a varied infection it is impossible to draw definite conclusions; but at this stage in a wound, so far as can be seen at present, the dose of organisms is of more importance than their nature. Three cases proved to be sterile on culture.

The importance of suture précoce cannot be overestimated. At no period is a wound so easily closed as it is before the onset of cicatrisation and fixation of tissues in abnormal positions. Not only does closure of a wound obviate the danger of secondary infection and the expense and pain of many dressings, but leads to the quickest and most perfect restoration of function. To be able to close wounds of soft parts and to convert compound into simple fractures is the ideal of military surgery. That this has been attained in 10 per cent. of cases recently arriving from the Front is a tribute to the work of the casualty clearing stations.

In conclusion, it seems proved that an important advance has been made in the treatment of wounds with a minimum disturbance of our present methods. The bacteriological examination of all wounds that seem in the least degree hopeful will repay the surgeon. When we commenced to suture wounds in the first few days, we were astonished to find wounds suitable which in that stage of our experience seemed quite out of the question. In the past we cannot help feeling we have subjected such cases to weeks, perhaps months, of repeated dressings which now prove to have been quite easily avoidable.

The saving in expense and labour and hospital accommodation is too obvious to require elaboration.

INCARCERATED SEPSIS.

BY ALBERT E. MORISON, M.B.EDIN., F.R.C.S.EDIN.,
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ALL surgeons meet with cases where, as a result of slight trauma to a previously infected part, there has been lighted up an infection after the primary lesion had apparently soundly healed. For example, as a result of breaking down adhesions or of correcting deformity in a joint, the seat of former tuberculous disease, an acute tuberculous infection has followed and resulted in death from acute miliary tuberculosis or tuberculous meningitis in a short time.

It is common knowledge that even a slight trauma, such as removal of a drainage-tube or rough handling of a granulating surface in the process of dressing a wound, may be followed some hours later by an increased temperature. Cases also occur in which, as a result of a slight operation for tuberculous disease or for the removal of a septic focus, an acute general infection has been set up which has resulted either in the death of the patient or in serious illness.

Results of Incarcerated Sepsis in War Wounds.

Instances of these serious results have been multiplied as a result of the war; few war wounds pursue an aseptic course, and many, after having healed for a considerable time, break down and discharge pus. Moreover, some wounds have been soundly healed for months, but as soon as an operation is performed the surgeon is disappointed to find that in a day or two the patient's temperature rises, he complains of pain in the operation area, and the wound is found to be inflamed and soon begins to discharge pus. In many of these cases, though there is little constitutional disturbance, the patient complains of discomfort in the wound, its edges are seen to be swollen and red, and on removing one or more sutures pus escapes. In these instances there may only be a very limited or modified sepsis, but the presence of pus may determine between success or failure of the operation.

These cases occur when the probability of a re-infection of the wound from without may be excluded. They happen in the practice of every surgeon who has had experience of present-day military surgery—and the only explanation that can be offered is that during the healing process organisms have become incarcerated in the deeper scar tissue of the wound, and have been set free by the operation. I do not know the proportion of infected wounds which heal with organisms buried in the scar, but in a fair number they can be demonstrated. Such organisms pent up in the scar may not only infect the wound locally, but may pass into the blood stream.

In the course of operations it may be evident that small foci of incarcerated pus or granulation tissue containing active organisms threaten the result, and in spite of attempts to sterilise the areas with a powerful antiseptic such as pure carbolic acid, infection of the wound may follow. It becomes necessary then to open up the wound and evacuate the pus. Between the examples of apparently normal scar and definitely infected areas there may be found a third variety—namely, small areas of softened tissue with much dense scar tissue round them, and bacteriological examination of these may demonstrate the presence of the usual pus-producing organisms found in septic wounds.

A further result of the continual irritation caused by the presence of these incarcerated organisms may be that a hard, dense scar is produced which causes pressure of underlying structures, especially serious when nerves are involved in it, or it interferes with the free movements of joints or of muscles. Where the scar is superficial great thickening of the skin and subcutaneous tissue results from keloid development similar to the familiar keloid burn scar. In the case of bone injuries a dense osteosclerosis is set up around such an infective focus, and when any strain is put on the part, such as occurs in walking or running, a dull aching pain, with in some cases great tenderness of the bone, and constitutional disturbances may be produced.

Treatment.

For the past two years I have made it a part of the routine preparation of cases, previously wounded but now healed,

before operation, to order that the seat of injury be treated for a week or 10 days with radiant-heat baths, from 150° to 250° F. for 10 minutes daily. If incarcerated sepsis is present the scar in the course of two or three days becomes inflamed; finally, fluctuation occurs and, as a rule, a small quantity of pus is evacuated. The wound is then encouraged to heal, and after healing, in a period of time varying from two weeks to three months, according to the severity of the secondary manifestation of sepsis, a further course of radiant heat is ordered. If no reaction occurs within a week the operation may be safely proceeded with so far as any danger of buried sepsis is concerned. In no case of mine in which this preliminary treatment has been carried out has there been failure with a rigid aseptic technique. The chief point I wish to make is that the wounds have, after this course, pursued a healthy manner of healing and no further infection has taken place. A smaller advantage of radiant-heat treatment is that the scars become more healthy and thinner, more mobile, and more elastic.

Lance-Corporal ——, G.S.W. of left forearm on Oct. 24th, 1916, admitted into Northumberland War Hospital, Nov. 1st. On admission: Great swelling of forearm, with two wounds. One longitudinal about 3½ inches long on lower part of flexor aspect with gaping edges and exposing torn muscle. A rubber drain passed from this through arm to second wound about 2 inches long on extensor aspect of forearm. Both wounds were actively septic, covered with grey unhealthy lymph and discharging pus; surrounding skin red, shiny, and tense. The end of a comminuted fractured ulna protruded through posterior wound; radius also fractured. Cultures taken by Dr. Clark showed *B. perfringens*, *B. coli*, staphylococci, streptococci.

Treatment.—Oct. 25th: Under C.E. wound was scraped out gently with sharp spoon, washed with 1–20 carbolic, packed with magnes. sulph. cream, and dressed with sterilised gauze and cotton-wool. Rectangular internal splint applied. Nov. 3rd: Patient complained of pain in arm. T. 101·6°. Considerable brawny swelling of arm extending above elbow; skin red and inflamed, and the bacteriologist reported anaerobic organisms present. Under C.E. vertical incisions were made into cellular tissue of upper arm, and these were washed out with magnesium hypochlorite and peroxide of hydrogen and dressed with mag. sulph. cream. Wounds in forearm looked clean and less swollen.

Nov. 8th: Secondary hæmorrhage from wound. Wound opened up and attempt made to secure bleeding points. As this could not be satisfactorily accomplished brachial artery was tied above bend of elbow and wound packed with gauze and dressed with Bipp. Nov. 15th: Dressed. Packing removed; very little discharge; no hæmorrhage; wound looked clean and healthy. Dressed with mag. sulph. cream. Nov. 24th: Dressed. Good deal of watery discharge on dressings; wound clean and covered with granulations. Bridge of skin between two wounds looked like sloughing. Dec. 1st: Dressed. Wound closing in; small piece of bone removed.

Feb. 16th, 1917: Wound healed. March 23rd: Movements much improved. X rays show gap of over 2 inches in middle of ulna; several loose pieces of bone; no displacement. Sent to convalescent home. June 1st: Returned from convalescent home. Wounds soundly healed. Ordered radiant heat daily. June 8th: Small focus of pus appeared in scar and burst this morning. June 15th: Wound healed. Returned to convalescent home.

July 14th: Returned from convalescent home. Radiant heat commenced. July 28th: No reaction to radiant heat. Operation. Scar over ulna excised. Graft about 3 inches long taken from tibia and implanted into gap in ulna. August 4th: Dressed. Wound healed. August 11th: Dressed. Arm put up in plaster. Sent to convalescent home for two months.

The method is simple and the results so satisfactory that I venture to suggest the adoption of radiant-heat treatment as a routine method of preparation, more especially in nerve and bone surgery, where the results of sepsis are likely to be disastrous.

I have to thank Colonel G. G. Adams, administrator, Northumberland War Hospital, Gosforth, Newcastle-on-Tyne, for permission to publish these cases.

Sunderland.

IMPRESSIONS OF X RAY TREATMENT.[1]

BY W. G. HARVEY, M.D. DUB., F.R.C.P. IREL.,

TEMP. MAJOR, R.A.M.C.; ASSISTANT PHYSICIAN AND IN CHARGE OF X RAY DEPARTMENT, ADELAIDE HOSPITAL, DUBLIN, ETC.

THE object of this note is to give an estimate of the value of Roentgen therapy in various conditions, derived from an experience of over 500 cases. The conditions dealt with were:—

1. Ringworm—in this the rays are used as an epilating agent. A fortnight after a proper dose of X rays the irradiated area sheds all its hair, healthy and parasitic, while some three months later a new growth of hair, free from the parasite, occurs. This treatment is the best for the cure of ringworm; it is certain, painless, and rapid, leaving the child free from infection within a month of starting. There are, however, many technical points which require attention, or accidents—e.g., alopecia—may occur.

2. The results in favus theoretically should be equally good, but such cases often become reinfected.

3. Rodent ulcers in general do well, unless the periosteum or cartilage be involved. True epitheliomata are more variable, but many respond well to X rays.

4. Epithelioma on a lupus site should never be treated with X rays—the results are very bad.

5. Warts—senile and juvenile—are amenable to X ray treatment. Four cases of warty growths on the feet did well.

6. Keloid is satisfactory in its response to X rays.

7. Lupus does well, but the cosmetic results of Finsen light are probably better. Tuberculin injections appear to favour the treatment.

8. Lupus erythematosus is not benefited.

9. The results with tuberculous glands have not been all that was to be desired.

10. Actinomycosis (one case) was not affected. In the treatment of neoplasms and deep-lying tissues much improvement has been obtained since the methods of "filtration" and "cross fire" were introduced.

11. The symptoms of Graves's disease subsided under X rays. No considerable benefit was derived in simple goitre.

12. Malignant tumours, whenever possible, should be surgically removed. When that is impossible X rays may occasionally bring about a cure, and frequently will relieve pain and diminish the tumour.

13. Uterine myomata and enlarged prostates require massive doses of X rays, but with such appear to do well.

[1] Read before the Section of Medicine of the Royal Academy of Medicine in Ireland.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF SUCCESSIVE GASTRO-JEJUNAL PERFORATIONS.

BY W. H. C. ROMANIS, M.C.CANTAB., F.R.C.S.ENG.

THE following case of successive perforations of gastric and jejunal ulcers is of interest not only on account of the number of occasions on which the patient perforated and recovered, but also because of the length of time during which she remained free from trouble, followed later by recrudescence of symptoms and further perforation.

The patient, an unmarried woman of 37, was first admitted to St. Thomas's Hospital on March 25th, 1903, with all the symptoms of perforated gastric ulcer; operation was performed by Mr. W. H. Battle and a perforated pyloric ulcer was sutured. She then remained quite well until the following October, when vomiting and gastric pains commenced, and in April, 1904, Mr. Battle performed an anterior gastro-enterostomy for pyloric stenosis. This was followed by a period of good health until May 5th, 1905, when she was readmitted to St. Thomas's with acute but obscure abdominal symptoms. Laparotomy was performed and a perforated jejunal ulcer 1½ inches below the gastro-enterostomy anastomosis was found and sutured; the patient made an uninterrupted recovery and 10 months' complete health followed. On March 14th, 1906, after a fortnight's epigastric discomfort, she was suddenly seized with severe pain and admitted to St. Thomas's, stating that she had perforated again. Mr. Battle again opened the abdomen and found and sutured a round perforation in the jejunum about 1/3 of an inch below its union to the stomach.

After this all went well for 11 years, and the patient was in excellent health till June 9th, 1917, when, after three weeks' "indigestion," she again presented herself at the hospital, declaring that she had perforated six hours before! That this had indeed occurred there was no possible doubt, and the writer was requested by Mr. Battle to deal with the case. Laparotomy (for the fifth time) disclosed an abdomen practically free from adhesions but full of fluid. No signs of the previous pyloric ulcer were present, the old anastomosis was patent and in good order, but in the jejunum ½ inch below there was a large round perforation surrounded by a small indurated area. This was easily closed with two continuous catgut sutures and covered over with an omental graft; the abdomen was mopped dry with gauze and closed without drainage. The patient made a rapid recovery, and when last seen was well and remained quite free from pain.

Many cases of jejunal ulcer following the operation of gastro-enterostomy—especially anterior gastro-enterostomy—have now been recorded, but it is well known that they apparently occur almost exclusively after operations for non-malignant disease of the stomach. A considerable number of such ulcers have perforated, but it is not many

patients who have been unfortunate enough to suffer from four successive perforations. The first three perforations in the above patient have been referred to by Mr. Battle in his work on "The Acute Abdomen," and it was through his courtesy that I was enabled to deal with so remarkable a case and at his request that these notes are now published.

A CASE OF GUNSHOT WOUND OF THE HEAD.

By WINIFRED BUCKLEY, M.R.C.S.,
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I venture to publish the following case as being one of general interest.

Private, aged 24, wounded in France early in October, was transferred to Military Hospital, Endell-street, on ninth day after injury. Statement on field medical card to the effect that he was suffering from "penetrating wound of scalp above and behind left ear, was much shaken and dazed; T. 98° F., P. 73." X ray showed piece of shrapnel 1·6 cm. deep in wound; no fracture apparent. The assumption was that foreign body was lying superficial to skull.

The morning after admission patient very drowsy, but conscious; T. 98°, P. 60. Pupils equal and reacting well. Discs showed some blurring of upper margin. There was no paralysis. The wound was slight and cicatrised. During the night he was very restless, and next day (eleventh from date of wounding) his condition became worse. By 4 P.M. he was deeply unconscious, very restless, and irritable; he had incontinence of fæces and urine, and fits started at 5 P.M. At 5.30 anæsthetic given and X ray taken; no fracture visible in plate.

He was taken to theatre, and on dissecting back the scalp flap I found a small punctured depressed fracture of parietal bone, with foreign body lying in it. I trephined over fracture, and on removing the bone an offensive odour was noticed and a quantity of septic blood-stained fluid escaped under pressure. The dura mater was torn and surface of brain bruised. A crucial incision of dura mater about 1 in. long was made; brain surface was irrigated with saline and some bruised tissue removed. It was then treated with spirit and B.I.P.P. Scalp flap was closed with four fishing-gut sutures; glove drain left in for 48 hours. The fluid contained streptococci and *Bacillus perfringens*.

The following morning patient was conscious and complained of headache. Temperature was raised for two nights and then became normal. The wound healed by first intention. A small pulsating swelling developed under flap on twelfth day after operation. This hernia subsided and disappeared a fortnight later. His mental condition became normal in a fortnight.

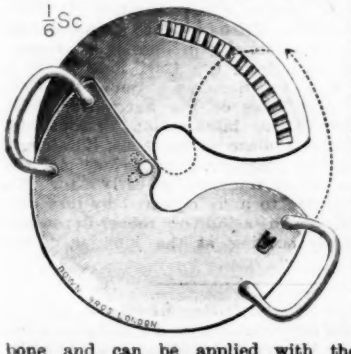
The ophthalmic surgeon observed increased blurring of both discs a few days after operation, and patient suffered from double vision for seven weeks. At the end of this time, he had headache and dizziness on walking. The double vision was less marked for distant than for near vision. In looking at near objects he saw two lines—the upper clear and horizontal; the lower starting at the same point but running obliquely down at about an angle of 30°.

His present condition is as follows. The wound is quite healed. He still suffers frequently from headaches. Sight good; no double vision now except when he looks down (extremely), and then it is only very slight. The ophthalmic surgeon reports that on rough testing the margins of the discs are clear and the right outer field of vision is absent. General health is good; intelligence unimpaired.

New Inventions.

AN AMPUTATION SHIELD RETRACTOR.

As is shown by the illustration, this retractor consists of two dish-shaped metal wings, which can be separated at the joint, passed over the stump flaps, and locked by a ratchet into a firm circular shield, on which traction is made by a pair of handles. I have used it now for over a year with satisfaction, and claim for it the following advantages: It is lighter than the average shield, it will go into the standard army steriliser, there are no parts that offer difficulty in cleaning, and it adjusts itself to the size of the bone and can be applied with the least amount of manipulation. The apparatus is made by Messrs. Down Bros., Limited, St. Thomas's-street, London, S.E.



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Reviews and Notices of Books.

Glaucoma. A Text-book for the Student of Ophthalmology. By ROBERT HENRY ELLIOT, Lieutenant-Colonel, I.M.S. (retired). London: H. K. Lewis and Co. 1918. Pp. 546. Price 21*s*.

Lieutenant-Colonel Elliot has produced a monograph on glaucoma notable for clearness and fair-mindedness, and it should find a place in the library of every ophthalmic surgeon. It depicts all aspects of the disease and does justice to the work that has gone before as well as to that accomplished by contemporaries.

Colonel Elliot insists throughout on precision in terms, the meaning of which he carefully defines. He holds that the glaucomatous process is all one, and that although we speak of acute, subacute, and chronic stages of glaucoma, those terms should not be employed as though they implied different diseases. The subject of intra-ocular pressure is handled in an informing way, and it is pointed out that in dealing with the physical conditions which govern the behaviour of the intra-ocular fluid as it passes into and out of the eye we have to do with a body of moving water, so that the laws are those of hydrodynamics and not of hydrostatics, as has been maintained. Systemic blood pressure and intra-ocular pressure are related, but the relationship may be masked or even neutralised by other factors and the important conclusion is reached that the high blood pressure of general arterio-sclerosis is "emphatically not a factor in the causation of glaucoma." The author holds that in most cases glaucoma is readily recognised. The expression "prodromata of glaucoma" is condemned, since he believes that an eye presenting such symptoms is definitely glaucomatous.

The sections dealing with the visual fields in glaucoma are among the best on the subject that we have ever read. Perimetry with large and small objects is discussed, and so is the anatomical distribution of the nerve-fibre bundles in its bearing on glaucomatous defects of the field. Great attention is paid to nasal contraction of the field, to Roenne's nasal step, to Bjerrum's sign, and to Seidel's scotoma. The author has devised a new type of perimeter (described in the appendix to the book), and by its aid has hit upon a novel sign of glaucoma, which, with considerable modesty, he speaks of as "a development of Seidel's sign," and which may well prove of considerable clinical value. Seidel's sign, it may be recalled, which is found in cases of early glaucoma, takes the form of wing-like extensions from the blind spot. Colonel Elliot has found that the paracentral scotoma does not end, as described by Seidel, in a single point, but in a number of points both above and below, thus representing lesions to a number of nerve bundles at the edge of the optic disc. To put the matter in another way, Seidel depicted the sign as resembling a crescent moon, while Colonel Elliot likens it to a spread-out painter's brush. The difference between the two observers may probably be explained by the fact that on his new perimeter Colonel Elliot works at intervals of 1 degree, which Seidel apparently did not.

In speaking of the medical treatment of glaucoma de Wecker's striking words are quoted: "If miotics have never cured a case of glaucoma, they have prevented many glaucomatous patients from being cured." Colonel Elliot believes that the moment non-operative means show failure to hold the disease in check surgical measures should be adopted. Iridectomy is fully described—its history, the period at which it may be undertaken, and its technique—and Colonel Elliot concludes that it should be done only in early cases, where there is reason for thinking that it may succeed in freeing the natural channels for the escape of the aqueous humour from the eye. The object of the newer operations is of set purpose to produce a so-called "filtering cicatrix" (a phrase coined by de Wecker), and Colonel Elliot candidly says that "not one has yet been received as the last word in the surgical treatment." Those operations, such as Helth's, which aim at involving the iris in the wound, are condemned by the author. Sclerotomy has failed to afford the satisfaction that it seemed to promise. A filtering cicatrix was first deliberately obtained by Lagrange in 1906. Other operations aiming at a similar result are those which bear

the names of Herbert, Brooksbank James, Fergus, and Elliot respectively. The trephine is employed both by Fergus and by Elliot, but there are points of essential difference between the two operations. For example, Fergus uses a trephine of large diameter, cuts the disc wholly from the sclerotic, and in some instances combines cyclodialysis with the operation. Colonel Elliot, on the contrary, employs a small trephine, and endeavours to reach the anterior chamber directly, thereby wholly avoiding the ciliary body. It is therefore manifestly unfair to speak, as some writers have done, of the "Fergus-Elliot" or the "Elliot-Fergus" operation. The small iridectomy combined with Elliot's operation is simply to avoid the risk of iris tissue becoming impacted in the trephine aperture.

Colonel Elliot's remarks upon the subject of secondary infections following the newer operations for glaucoma, as upon many other points in this timely book, display his fair-mindedness. We recommend the book to all those interested in the subject of glaucoma.

Lyon's Medical Jurisprudence for India, with Illustrative Cases. By L. A. WADDELL, C.B., C.I.E., LL.D., M.B. Glasg. Sixth edition. Calcutta and Simla: Thacker, Spink, and Co. 1918. Pp. 783. Price 28*s.* net.

IN preparing his new edition of Lyon's book Dr. Waddell has taken the opportunity of revising it throughout and rewriting several chapters. Extended use is made of the unique Indian experience of Dr. Arthur Powell, professor of medical jurisprudence at Bombay University, and for a long time a coroner's surgeon. Attention is drawn to his remarks on leprosy in relation to the law, in which is pointed out the unsatisfactory definition of a "leper" within the meaning of the Act. A leper is there defined as "any person suffering from any variety of leprosy in whom the process of ulceration has commenced." As Dr. Powell remarks, this definition is by no means scientific. The ulceration need not be leprous ulceration. Thus any form of ulcer, whether arising from trauma, such as abrasion or wound, from varicose veins, &c., might be sufficient to bring the leper within the Act. The Act as it now stands, therefore, is liable to be unfair to the individuals concerned. The drawing and description of *Trichomonas vaginalis* given by Dr. Powell differ materially from those found in other text-books. He maintains that the animal is pear-shaped, with a short stiff rod at the pointed end. Its power of locomotion under a cover-glass is small, although rotatory movement is rapid and the lashing of its flagella makes it difficult to count their number. At the upper end he figures three of these, but notes the absence of cilia described by other authors.

The chapter on blood-stains by Lieutenant-Colonel W. D. Sutherland, I.M.S., is of considerable interest. A coloured illustration is given which makes it easier to follow the precipitin test for human blood. In India, we are told, it is frequently necessary to examine earth that has been dug up from the floor of a dwelling or a courtyard, with a view to ascertain whether the stains on it are due to human blood, and it is difficult to obtain a clear extract. The fluid remains turbid on account of the particles of clay that remain in suspension, in spite of repeated filtration and centrifugalisation. Colonel Sutherland says that this difficulty may be simply surmounted. Instead of viewing the tube contents against the light, they should be viewed against a black background held nearly at right angles to the light. When so viewed the turbidity of the extract-dilution, which was marked when viewed against the light, will be found to have disappeared, while the layer of reaction, if present, remains clearly visible. Details of findings are given in regard to more than 13,000 articles suspected to be blood-stained, examined in 5000 medico-legal cases and form an interesting record. Cases are related demonstrating the value of the test. The section dealing with toxicology has special merit, and the large number of cases quoted make good reading.

The whole work is written in an engaging manner, and although intended primarily for Indian use, forms a good text-book on medical jurisprudence, which might specially appeal to the Indian students at medical schools in this country. As on previous occasions, we can cordially recommend the manual to students and those interested in forensic medicine.

JOURNALS.

The American Review of Tuberculosis (Baltimore: National Association for the Study and Prevention of Tuberculosis. Price 35 cents) for January, 1918, contains several useful original articles, the first of which, by Dr. Joseph H. Pratt, is a well-argued plea for prolonged rest in bed in pulmonary tuberculosis. With blunt directness the author says: "The treatment of pulmonary tuberculosis, as generally carried out in this country, is yielding poor results. Something is radically wrong. It is time that physicians and social workers awoke to a realisation of this fact." For the past ten years the author has employed prolonged rest in bed even in afebrile cases, and he has adopted this principle in three classes of patient—the poor treated in their own homes, private patients in their own homes, and private patients in a sanatorium. He compares his results with the results obtained at Frimley by the graduated exercise method, and arrives at the conclusion that the latter yields ultimate results far inferior to the former. The difference between the two is, indeed, startling; but, as the author admits, his figures are small, dealing, as they do, with only 191 cases. All the same, his arguments for absolute rest and against the cure-you-while-you-cough ambulatory school are certainly cogent and timely. In a paper by Dr. Bernice W. Billings and Dr. John B. Hawes with the heading, "Are Sanatoria Worth While?" many facts and figures are given to support the answer in the affirmative. A curious conclusion to which the authors have come is that the prognosis in "advanced" cases is often good: 22 per cent. of the patients in this class were, as the result of sanatorium treatment, subsequently "in good condition and working." In this connexion they suggest that the present methods of classification are imperfect. In the term sanatorium treatment they include the education of the patient and his family and his supervision after discharge. They stipulate that sanatorium treatment to deserve this title must signify residence in a properly conducted sanatorium for over six months, a stipulation which in practice is more often flouted than accepted. In a concise paper Dr. Alfred Hess gives an account of two years' experience with a preventorium for infants one or both of whose parents were tuberculous. At first only infants already infected with tuberculosis, as shown by a positive tuberculin reaction, were admitted. But owing to the early and high mortality from tuberculosis in this class of case this policy was abandoned, and only infants giving a negative reaction were admitted. Provision was made for keeping the infants at least a year in the preventorium, and it was seldom difficult to obtain the mother's consent to this long separation; in many cases the mother died before the year had expired. The author is convinced that the principle of prevention can be applied to the infant with a tuberculous mother with lasting benefit to the coming generation. This number also includes a paper on skin tests with various antigens, and on complement fixation, by Dr. F. W. Wittich, and a paper on animal experiments in immunity and treatment with cell poison obtained from sputum by Dr. W. B. Howes.

Journal of the East Africa and Uganda Natural History Society.—The February issue of this publication (London: Longmans, Green, and Co. Price 5*s.* 4*d.* to non-members.) has for a frontispiece a coloured reproduction of *Francolinus nahani*, a rare bird from the Ituri Forest. It is described by Mr. V. G. L. van Someren. Among the other interesting contents are Notes on the Early Hominidæ, by Mr. E. Wynstone-Waters, late senior demonstrator in anatomy at the Royal College of Surgeons, Edinburgh, dealing with the Piltdown fragments, and reviewing briefly the salient features of other fragments of early man. Mr. R. E. Dent calls attention to a fly observed by him near Kyambu, and classed as an asilid or robber-fly, which attacks ants, apparently sucking at the junction of the abdomen and thorax.

LITERARY INTELLIGENCE.—Messrs. J. and A. Churchill announce for early publication a translation from the Swedish of a book on Massage and Medical Gymnastics, by Dr. Emil A. G. Kleen. The section on Medical Gymnastics is by Dr. J. Arvedson. The translation has been made by Dr. Mina L. Dobbie, medical officer to the Chelsea Physical Training College.

THE LANCET.

LONDON: SATURDAY, APRIL 13, 1918.

The Man-Power Bill.

THE Prime Minister introduced in the House of Commons on Tuesday a Bill making feasible a further draft on the man-power of the country, and the military age now runs from 18 to 50 inclusive, or 55 in the case of qualified medical men, further extension being suggested in other special cases. The inclusion of Ireland under the principles of conscription will take time for its accomplishment, and already Irish resistance is developing against the conditions suggested and along the lines and for the reasons expected.

The large extension of the age-limit clearly brings into the ranks many men who can only be used as substitutes and makeshifts, permits others, mostly their juniors, to take more active rôles; and it is clear, also, that of such men quite a large proportion must be abstracted from places where they are doing excellent work, and where their age is no drawback to their efficiency, but acts rather as a guarantee of matured experience. The physical condition of the potential recruits will call for much discrimination, and the early work of the Tribunals, which are to be revised and reconstituted, will be of an arduous character, for who shall be taken and who shall be left will often depend on factors of opposing influence. The first thing to ensure is that the men taken are taken from places where removal puts no check on war-work as it is now proceeding, and the exact definition of war-work is not easy to find. The second thing is to see that to some extent the military employment coincides in character with the civil employment. It will surely happen that some persons who can be spared from their present work cannot be given employment with the Army for which they are immediately fit, and conversely, that men of particular vocations or training are sorely needed in civil as well as in military capacity—this is the case with medical men. And cutting across these groups comes the question of physical efficiency, for in some cases those who can best be spared will not be fit to go or will not possess the necessary physical adaptability, while in other cases the men who pass the physical tests will not possess any qualities of particular value in military employment.

It was the sense of the House of Commons, as it is the sense of the country, that military needs come first. Were this not so obvious it would be necessary to say something of the proposed curtailment of right of appeal on medical grounds; but looking at history, as it is in the making, we say nothing save that the enrolment of an invalid is a very uneconomical proceeding.

Food Readjustment.

THE edicts of the Food Controller, which have received a great extension this week, have met with a ready acceptance by a large section of the public, due in no little degree to the Controller's willingness to readjust details in the light of fresh knowledge and experience. The factious critics, though in evidence, do not make a logical show. The promised concession to children over 6 years of age of the full meat and fat ration is very welcome, as well as the allowance to boys over 13 of an extra portion of bacon. The difference between the adult ration for male and female has been justified by the smaller surface of trunk and limbs in the latter, and consequent diminished radiation of heat. Whether the lanky school-girl will look at the matter in quite the same light is doubtful. Some demur has been evident regarding the existing concessions to certain types of disease or disability. In the *St. Mary's Hospital Gazette* an editorial article reasonably regrets the encouragement of the old-fashioned plan of stuffing a glycosuric patient on fat and meat which the concession in regard to diabetes has given, suggesting that wider recognition might well have been offered to the fasting treatment and the gradual re-education of the patient's metabolic powers. The present compulsory diet, including little meat and fat and much green vegetables, might save rather than lose diabetic lives. A similar criticism has been made of the tuberculosis diet with less justice, for there is good evidence that a dietary deficient in protein makes the organism more liable to tuberculous infection. The medical advisers to the Controller have been scrupulously anxious to deal fairly with all classes of invalids, but it is perhaps a little unfortunate that so much emphasis has been laid on such a detail as the diet in cœliac disease. The prominence given to this condition has much puzzled the public mind, while the recent Lumleian lecturer, in the latest scientific pronouncement on the matter, by no means favours a more liberal diet in this rare condition.

At a meeting of the West London Medico-Chirurgical Society held last week Dr. ROBERT HUTCHISON discussed the medical aspects of food out of the fullness of his familiarity. He considered the effects of the diminution of the diet as a whole; the effects of an altered ratio of the chief nutritive constituents; and the effects of alterations in quality of staple foods, and came to clear and useful conclusions. The present diet has undoubtedly caused a reduction in the weight of many people, and has occasioned in the minds of patients and doctors some apprehension. But Dr. HUTCHISON pointed out that this loss of weight was not progressive, being due to several factors in fundamental metabolism. The practical point for those of us who have to advise our patients is to know at what point loss of weight becomes serious, and in Dr. HUTCHISON'S opinion a loss of 10 per cent. of normal body-weight is not harmful and may indeed be beneficial; but in

this connexion he gave one practical piece of advice, showing an obvious way in which the organisation can be spared—unnecessary exercise should be avoided. The counsel is so simple that we should lay no stress upon it were it not that it is being at the present moment largely disobeyed. All the muscular energy that the country can spare has to be put into national work executed in the trying circumstances both of depleted man-power and of diminished facilities of transport. Such exercise must be taken and it is often very severe; but to take exercise for the sake of exercise is merely silly, or it is a confession of inability to find anything else to do. Dr. HUTCHISON deprecated even the strenuous athletics of schoolboys, but here we join issue with him. These boys may be wanted to take on the hard military life at short notice and should be ready to do so. Their food is now sufficient in most cases, but care should be taken that they are warmly clothed and given extra sleep. These precautions will counteract the losses due to exercise. Reduced diet favours tuberculosis in Dr. HUTCHISON'S experience, but he does not point to a similar ill-effect in septic diseases. As to the alterations of ratios, he finds nothing dangerous to health in these, a conclusion to which we had come previously in these columns. It has been said that "if you look after the calories the proteid will take care of itself"; meat is one of the most valuable of proteids, but the proteid of potatoes is excellent. In some diseases such as gout, migraine, and epilepsy, reduction of meat had been entirely beneficial, and the same holds good in Dr. HUTCHISON'S view, and our own, with regard to renal and chronic vascular disease. There is considerable doubt whether fat is absolutely necessary in the dietary of the healthy adult, and cannot altogether be replaced by carbohydrate. Some complaint continues to be made of the irritant action of wholemeal bread in cases of colitis, but here extended experience tends to confirm the observation that war bread is not worse tolerated than other kinds of bread, and that a permit for white flour is not the desirable remedy. We are glad to find that Dr. HUTCHISON is of this view. By retaining another 10 per cent. of the grain the nation can be fed for a correspondingly longer period with the same quantity of grain; moreover, the absorbability of the bread is as great as that of white bread. We have no sympathy with complaints concerning war bread, which have been founded largely on imagination or bad baking. In any case we must remember we are at war and not agitate for alteration of the rations except in cases of absolute necessity. Whims must not be considered.

Reviewing the whole question, it may be said that our food difficulties so far have had no adverse effect on health. Appropriate levelling-up and levelling-down have indeed both tended to the health and social harmony of the community at large. But while this is so, it is inevitable that the national ration, if rigidly enforced, may entail hardship on certain individuals owing to fixed habits and tastes, and we should like to call attention to the readjustment which is possible within the limits of the household, which is in practice the rationed unit. The case of Mr. and Mrs. Jack Spratt, whose marked preferences in regard to a fatty dietary were mutually adjusted, is what the lawyers would call the leading case in the matter; and the larger the family circle and the greater the difference in the ages and conditions of the constituents of that circle, the more will mutual adaptability lead to good result.

Prevention of Measles Mortality.

THE publication of a report to the Local Government Board, by Dr. A. S. MACNALTY,[1] on the prevention of mortality and disablement due to measles and pneumonia in children once again recalls the dangers of measles to the community, and the practical impossibility of exerting any material influence on the prevalence of this disease. It is still the fact that in populous areas in this country all children will at some period or other be exposed to measles infection, and that the great majority of them will take the disease. There is a large body of experience, dating back at least 30 years, of the result of efforts made in particular districts to prevent the regularly recurring outbreaks or exacerbations of measles by means of local notification, special inquiry for early cases, isolation, disinfection, and like measures. The control thus secured over the spread of the disease has in all cases been very limited, and often has practically failed. Such measures have a better chance of success in sparsely populated country areas, where the introduction of infection from without is of rare occurrence, and a longer period is needed after an epidemic to accumulate a susceptible child population. It is not, however, an unmixed advantage to the adult who comes from these remoter areas to town life, or who enters the Army, that he has hitherto escaped exposure to measles. The disease in the adult is quite as formidable and needs as much attention and care to prevent serious complications and secondary infections. In the last four years many soldiers from country districts have had good cause to wish that they had already been "salted" against this infection—a wish which would undoubtedly be shared by all administrative and hospital medical officers who have experienced the anxieties of unexpected measles outbreaks in the armies at home and abroad. Somewhat similar drawbacks sometimes attend the postponement of a boy's exposure to measles until near the end of his school life—a not uncommon occurrence at public schools. Indeed, looking broadly at the matter, an attack of measles in a young child, especially if past the age of 5, is not usually any matter for regret, provided always that the conditions under which the patient is cared for and treated are satisfactory.

It is this proviso, however, that needs constant attention in every case of measles. Each year some 13,000 deaths are registered as due to this cause in England and Wales, while it leaves a

[1] Local Government Board Public Health Reports, New Series No. 115, H.M. Stationery Office. Price 1s. 6d.

formidable toll of disabilities among the survivors in the shape of ear and eye affections and enhanced liability to other diseases. It is well known that neither deaths nor disabilities due to measles occur at all frequently in better-class households where, as a matter of course, the child receives medical attention, is at once put to bed and nursed, isolated from others, kept warm in a well-ventilated room, and attended to during convalescence. In these conditions the formidable secondary infections which so often follow measles are avoided, particularly the respiratory infections, which are common when the case is treated in a crowded bedroom, dormitory, or even hospital ward; good nutrition is secured and ear troubles or other local complications can be detected and dealt with as they arise. The attack now being made on measles mortality by the local public health authorities is directed to securing conditions comparable to these, so far as circumstances permit, in ordinary working-class homes, and particularly in poor and overcrowded districts. The task is a difficult one, and in extreme instances—for example, a whole family with only one room to live in—it is obviously impossible to get very far in the desired direction. Already, however, encouraging progress has been made in some towns. Notification of the disease sets in motion a machinery by which the services of health visitors are secured, use is made of the local child-welfare organisation, and special arrangements are entered upon for the periodical visits of nurses. Apparently arrangements can now be officially sanctioned for medical aid to be supplied in suitable cases at the cost of the health authority, independently of the Poor-law Medical Service, on the report of the local health visitor or nurse. For a minority of cases also hospital treatment is made available. The measures which can be taken in these directions, with the assistance of grants from the Local Government Board, are discussed by Dr. S. W. WHEATON in a memorandum attached to Dr. MACNALTY'S report.

The report will much assist medical officers of health and practitioners by bringing together and classifying clinical and bacteriological knowledge of the different complications of measles, the circumstances in which they occur, and the practical measures which are indicated for their prevention. It has obviously been prepared after a wide reading and study of the subject, and is specially welcome at a time when all causes of child mortality are demanding attention, and the need for an effective reduction in the deaths resulting from measles has received exceptional prominence through the introduction of compulsory notification of the disease. A valuable addition to the report is the supplementary section dealing on the same lines with the mortality from pneumonia in children, whether related to measles or not. Reduction in this mortality may be brought about by judicious application of similar methods of health visiting, provision of nursing, and medical treatment, which are now within the competence of local health authorities.

Annotations.

"Ne quid nimis."

THE POSITION OF SMALL-POX.

DURING the present outbreak of small-pox in London 32 cases have occurred so far in the metropolitan area, in addition to 3 associated cases in East Ham. Following upon the death of the first sufferer in the week ending Feb. 16th there occurred 5 cases in the week ending March 2nd, and 5, 16, 5, 1, and 2 cases in the successive weeks following. The last patient was removed to hospital from an address in Poplar on April 1st, and the other inmates of this house have been vaccinated. Up to April 15th there will still be the possibility that unknown persons with whom the man came in contact may develop small-pox. In Stepney, where most of the cases have occurred, the contacts have been kept under observation in the borough council's shelters, where they have received board and lodging during the incubation period. Out of the 23 cases which have occurred in this borough 10 came from the observation shelters whence they were removed in the early stages of the disease. The value of this precaution in preventing the spread of the disease has thus been demonstrated, as was the case in the 1911 outbreak, which also occurred in Stepney. The moral to be drawn is the obvious one that in every borough in London, and in the surrounding areas, a shelter should be in readiness to receive contacts of persons developing small-pox. The source of the present outbreak is still obscure, but the fact that the area in Stepney originally infected was frequented by sailors has led to the hypothesis that the disease was thus introduced. The type of disease has been very mild, as is evidenced by the fact that only one death has occurred. Three cases had already been discharged from hospital by April 8th. The additional precaution has been taken by the London County Council of making chicken-pox notifiable for a period of three months ending June 30th next. This is a measure which leads to the early detection of small-pox, and would appear the more necessary as there is considerable likelihood that, after the present outbreak of small-pox comes to an end, further cases may be introduced into the county. A few cases have occurred recently in the North of England.

The public health authorities in London are to be congratulated on their success in tracing the movements of the cases and securing the observation and vaccination of all known contacts, but great vigilance is still needed in view of the specially serious consequences which a large outbreak of small-pox in London would entail at the present time, and of the exceptional opportunities of spread of infection by a missed case which are afforded by present conditions of traffic and the accidents of air-raids. It is in the public interest as well as in that of the individual that the vaccinations and revaccinations which have been so numerously performed during the past weeks should continue. We understand that this position has been adopted in the various public offices and Government works. Although, fortunately, no cases of small-pox have occurred there, the departments concerned have officially advised the staffs that all persons whose protection has declined through lapse of time, or whose original marks of vaccination are imperfect, should forthwith be revaccinated.

CLINICAL RESEARCH AND THE PHYSIOLOGY OF THE SPINAL CORD.

THE war has given us many opportunities of studying the results of gross injuries of the spinal cord and cauda equina, and this study has firmly established the physiological principles resulting from the clinical work of Hughlings Jackson, the morphological investigations of Gaskell, and the laboratory experiments of Sherrington, Langley, Anderson, and others of the Cambridge School of physiologists. To an exposition of certain of these phenomena the greater portion of the last number of *Brain* (vol. xl., Parts 2 and 3), edited by Dr. Henry Head, is devoted. The number opens with a review of the innervation of bladder and urethra, by Dr. E. G. Fearnsides, giving a retrospect of knowledge upon the involuntary nervous system and its relations with the lower portion of the spinal cord. Dr. Head and Captain G. Riddoch follow with a paper on the automatic bladder, excessive sweating, and some other reflex conditions, while in a third paper Captain Riddoch discusses the reflex functions of the completely divided cord in man and compares them with those of less severe lesions. All these authors agree with Sherrington that inhibition is one of the most fundamental and universally applicable of all physiological conceptions. In his masterly work on the integrative action of the nervous system Sherrington showed more than a decade ago that the basis for understanding the activities of the central nervous system must be sought in its integrating and adapting functions and the investigations now recorded by Head and Riddoch, and by Riddoch alone, serve to emphasise the importance of the mechanism which Sherrington has called postural in determining the type of response in a man whose spinal cord has been severely damaged. So long as this mechanism is intact, the impressions which constantly pass from the otic labyrinths and somatic muscles to the cerebellum, pons and mid-brain determine a state of tonic contraction in the group of anti-gravity muscles. When the damage is severe enough to destroy the postural mechanism the lower portion of the spinal cord is found to react to stimuli of whatever origin in a manner called mass-reflex by Head and Riddoch. Whenever the cord reacts in this massive manner three types of adaptive response only have been determined:—

(*a*) *Protective:* A uniphasic withdrawal of paralysed parts after "harmful" stimulation ("flexor spasms"). (*b*) *Excretory:* By this form of activity the contents of the bladder and rectum are discharged, whilst the skin over the parts supplied through sympathetic fibres derived from the freed portions of the spinal cord is excited to intense sweating. (*c*) *Sexual:* A primitive type of reaction which is excited to activity by stimulation of either the external organs of generation or of the paralysed parts.

Whenever, on the other hand, the postural system can be proved to be still active, differentiation of somatic and visceral activities is found, the massive type of response ceases, and the phenomena of inhibition, as shown by a limitation in the range of efferent motor responses, make their appearance. The reactions obtained from the central nervous system are now di-phasic or multi-phasic, while somatic and visceral responses are separated. The receptive field for the flexion-reflex, for example, now no longer extends over the whole of the paralysed regions. The clinical investigations recorded in these papers further go to prove that the thoracico-lumbar outflow of the sympathetic nerve fibres, which pass into the involuntary nervous system, regulate sweating and control the functional activity of the bladder, are at origin segmentally arranged; and that the arrangement is closely similar to, if not absolutely identical with, that which Gaskell, in 1886, showed to be true for lower mammalia. In their course these efferent fibres are closely associated with afferent fibres passing similarly from the viscera, blood-vessels, and other parts supplied by the efferent fibres. As a part of the generalised "mass-reflex" in cases of severe injury to the spinal cord, excessive sweating takes place over areas of skin supplied by sympathetic nerve fibres originating below the level of the lesion. Even when the bladder is freed from all central nervous connexions and control, it may begin to expel its contents automatically as early as 25 days after the injury. The form assumed by the activity of such an automatic bladder is entirely independent of the site of the lesion in the spinal canal. In the absence of the postural mechanism automatic evacuation may be facilitated by the most various afferent impulses passing into the lower portion of the spinal cord, unless a cauda equina lesion prevents the impressions from reaching the cord. Through the afferent fibres associated with the sympathetic outflow, and reaching the bladder via the hypogastric nerves, a patient may be conscious of alterations of tension within his bladder and yet be totally unable to effect by conscious effort its automatic activity. The lesson is drawn that in cases of spinal lesion, whether due to injury or disease, it is essential to avoid exercising undue tension on the bladder wall when washing out the bladder; undue pressure diminishes the power of spontaneous evacuation and retards the recovery of the vesical musculature. We offer our congratulations to the authors named upon a piece of brilliant clinical research.

THE STANDARDISED INFANT.

DOGMATIC teaching is recognised as a useful method of introducing students to a subject which is new to them, and represents an economy of effort on the part of both teacher and pupil. It has its place even in regard to subjects in a state of flux, where any standard set up must be an artificial and temporary one. Such standardisation is more proper on the teaching than on the research side of any study, and it may, if unchecked, lead in the long run to stagnation and to want of progress in directions where change is the inevitable accompaniment of growth. In the campaign on behalf of the health of women and children, successfully waged by the Royal New Zealand Health Society for many years past, standardisation of method has proved fruitful of great results. Initiated by Dr. F. Truby King at the time when Lord Plunket was governor of the Dominion, and carried through with infinite patience over a period of discouragement, the scheme now includes 35 nurses whose general training of three years or more has been supplemented in some cases by a further year of maternity work and in all cases by three months or more of special study at the Karitane-Harris Baby Hospital. These Plunket nurses carry out over the whole area of New Zealand a series of health recommendations which in course of time have crystallised into three pamphlets, written by Dr. Truby King and issued by the Public Health Department, on the expectant

mother, the baby in the first month, and the feeding and care of infants in general. Personal work of this kind has been assisted by wholesale coöperation on the part of the New Zealand press which prints some 200,000 copies weekly, under the heading of "Our Babies' Column," of instructive matter supplied to it by the Health Society. Coming from such a successful and comprehensive scheme of dogmatic teaching, Dr. Truby King is now paying a welcome visit to this country in the hope of contributing to a similar health campaign, especially in the direction of forming a general consensus of opinion in regard to elementary matters of physiology and pathology of infant life. He has undertaken the charge of a clinic placed at his disposal by St. Thomas's Hospital. It is true that the National League for Health, Maternity, and Child-Welfare has issued from its office at 5, Tavistock-square, London, W.C., a booklet in pamphlet form dealing with matters of maternal and infant hygiene, but the recommendations contained therein are of a general character, arrived at in the spirit of compromise, or in much the same way as the highest common factor is obtained from a group of large numbers. Dr. Truby King uses a percentage whey mixture which has become the standard method of artificial infant feeding at the Antipodes, and involves the use of lactose, which in this country is now both scarce and costly. Here and in America there is still an almost infinite divergence of practice, which may, of course, be evidence that the one ideal method of artificial infant feeding has not yet been found, but it is, at all events, a testimony to the infant's power of adaptation to his environment amounting to little less than genius. To take a single example, in London the infant whose parents cannot afford to give him fat in any of the usually approved forms has shown his capacity to digest and assimilate linseed oil in suitable emulsion, although the Bradford baby is stated to rebel at the substitute. The necessity of adding lactose to the milk mixture in artificial feeding has long been disproved by the experience that any form of sugar is equally well assimilated by the London infant if given a little time for the necessary adaptation. To adopt in London the humanisation of artificial milk on the New Zealand plan would therefore appear to be retrograde and costly, a fact to set against the advantages of a simple dogmatic scheme of teaching infant welfare workers. The successful breeding of calves and pigs on a large scale is undoubtedly expedited by the adoption of routine methods, but we have seen during the last few months many changes dictated by war conditions to which the youthful cattle have accommodated themselves with a good grace. It is, at all events, arguable whether the human infant should be standardised, and the more the important points involved are examined the better for our knowledge, assuming, of course, that only those speak who have personal experience of the subject.

THE TREATMENT OF STERILITY.

THE whole subject of sterility in the female is worthy of more study and research than it has yet received, and much of the treatment suggested is purely empirical and not founded upon any accurate knowledge of the etiological factors. No case can be considered to have been properly investigated in which the husband is not subjected to as thorough an examination as the wife. This is, however, rarely carried out. The causes of sterility in the female may be classified under the four headings of structural, bio-chemical, functional, and psychic, and the more we consider these four classes the less we find we know about them. Fertility requires not only the presence of healthy spermatozoa and healthy ova but also their normal conjugation, which probably involves certain bio-chemical interactions, of which we are as yet quite ignorant. In a given case of sterility it is the exception to find any recognisable pathological change in the female pelvic organs—that is, if we include only those cases in which the patient primarily seeks advice for her sterility. An obvious and complete obstacle to fertilisation is the closure of the two Fallopian tubes as the result of preceding salpingitis or pelvic peritonitis. The operation of salpingostomy has been devised for the purpose of overcoming this difficulty, but it is doubtful if the successes resulting from its performance are at all numerous. In many cases the artificial opening made in the tube in all probability becomes secondarily closed. At a recent meeting of the Royal Academy of Medicine in Ireland Dr. Hastings Tweedy showed a specimen of ectopic gestation removed from a tube which he had resected on two previous occasions. On the latter occasion catgut was placed in position in the tube, and the specimen showed that it gave free passage to spermatozoa. He attributed the ectopic gestation to the irritative effects of the chromicised catgut. Dr. Hastings Tweedy described a method of passing silkworm gut into the tube and removing it after three to four days by means of a plug of iodoform gauze left in the uterus. Dr. Bethel Solomons read notes of a similar case of ectopic gestation after resection of the tube and the insertion of a piece of catgut to keep it open. These two cases are very interesting, but it might be argued that, if the tubes had only been resected and no catgut placed in the lumen, the patients might not only have become pregnant as they did, but the fertilised ova might have passed into the uterine cavity and progressed normally to full term. The idea is an ingenious one and it will be interesting to see if any further successful cases, if these cases merit that description, are recorded.

ALTERATIONS AND AMENDMENTS IN THE BRITISH PHARMACOPŒIA, 1914.

IN pursuance of the Medical Act, 1858, and of the Medical Council Act, 1862, the General Medical Council have directed alterations in "The British Pharmacopœia, 1914," by withdrawing from the publication until further notice certain medicines and compounds and the directions for preparing them, and by modifying other directions contained therein. The alterations and amendments, which will have effect until further notice, are set out in the following schedule:—

The following are withdrawn until further notice, namely: Linimentum Camphoræ, Linimentum Chloroformi, Linimentum Hydrargyri, Linimentum Terebinthinæ Aceticum, Liquor Cresol Saponatus.

The following notes are appended to the official monographs on Adeps Præparatus, Oleum Arachis, Oleum Olivæ, Oleum Ricini, Oleum Sesami, and Sevum Præparatum, respectively, namely:—

Adeps Præparatus, Sevum Præparatum.—Wool fat, or hydrous wool fat, singly or together, with such addition (if any) of hard paraffin, liquid paraffin, soft paraffin, paraffin ointment, white beeswax, yellow beeswax, or any combination of these as may be necessary to impart a proper colour and consistence to the product, may be employed in making

the official preparations for which prepared lard, or prepared suet, is directed to be used; but the official proportion of the active ingredient must in all cases be maintained.

Oleum Arachis, Oleum Olivæ, Oleum Sesami.—Arachis oil or sesame oil may be employed in making the official liniments, ointments, plasters, and soaps for which olive oil is directed to be used.

Oleum Ricini.—The modified castor oil of commerce, commonly known as "neutralised seconds castor oil," may be employed in making the official preparations for which castor oil is directed to be used.

THE PROPHYLAXIS OF LOBAR PNEUMONIA IN SOUTH AFRICAN MINES.

THE prevalence year by year of pneumonia among the natives employed in the South African gold and diamond mines has in the past seriously hampered these industries. In this connexion our readers may remember that in 1912 the skilled assistance of Sir Almroth Wright was obtained, and that under his advice a prophylactic vaccine was used, with the result that a remarkable reduction in the mortality from pneumonia among the native mine-labourers was recorded.[1] At the time, however, the existence of definite groups of the pneumococcus, distinct and possessing specific immunity reactions, had not been placed beyond doubt, so that it is not known what groups of the pneumococcus were included in the vaccine used by Sir Almroth Wright. Since then the subject has been still further investigated, and a report has been recently published by Mr. F. S. Lister, bacteriologist to the South African Institute for Medical Research, giving the results of experimental inoculation of natives employed in the Premier (Diamond) Mine and the Crown (Gold) Mines in the Transvaal, as well as in the De Beers (Diamond) Mines at Kimberley, with a specific group vaccine containing those varieties of the pneumococcus known as "A," "B," and "C," which are recognised as being very frequently the cause of pneumonia prevalences among the mine-workers of South Africa. The observations of Mr. Lister cover the period of 12 months ended Oct. 31st, 1917. He states that experimental inoculation of rabbits had already shown the possibility of conferring immunity against pneumococcal infections. So that when, in the autumn of 1916, pneumonia began to be very seriously prevalent in the mines a prophylactic vaccine prepared from the three groups of the pneumococcus known as A, B, and C was employed, three subcutaneous inoculations being made at short intervals. The result has been most encouraging; in the Crown Gold Mines, for example, the inoculated natives became quite immune to infection from these three groups of the organism. But as some instances of lobar pneumonia were still found to occur in these and other mines, and as they were proved to be due to other groups of the pneumococcus, known as "E," "H," "J," and "K," it is proposed to continue the study of these four groups so as to include them in future vaccine intended for the protection of the native workers in South African mines. Mr. Lister's observations are valuable, and should receive careful study by all interested in the prevention of pneumococcal infections.

THE next quarterly meeting of the Medico-Psychological Association of Great Britain and Ireland will be held at 11, Chandos-street, Cavendish-square, W., on Tuesday, May 28th, instead of on Tuesday, May 21st (the date previously arranged).

[1] THE LANCET, 1914, i., 87.

THE VITAL STATISTICS OF 1916.[1]

IN the year 1916, and none too soon, this country settled down into war conditions, and the present report affords instructive lessons to all of us. In spite of the continuous drain on the resources of his department, Sir Bernard Mallet must be congratulated on the promptitude with which the publication of this work has been accomplished. That a report of nearly 500 folio pages should have been completed within ten months of the issue of its predecessor is an achievement which entitles the Central Office to the gratitude of the Public Health Service, to whom this volume is indispensable. In a necessarily condensed review of a valuable document we are supported by the remembrance that the chief facts concerning natality and mortality of the year 1916 have been provisionally published in the "Annual Summary," which appeared in March, 1917.[2]

The *birth-rate of 1916* was 20·9 per 1000 living and was the lowest on record. It was 4·6 below the average for the ten years 1905–1914 (which were practically unaffected by the war). On the whole, the reduction of English natality which accompanied the war, and which amounted to about 12 per cent. on the figures for 1914, is less than might have been expected and compares very favourably with the experience of other belligerent countries.

The *civilian death-rate* in 1916 was 14·4 per 1000 living, and was slightly below the average death-rate of the decennium before the war, which was based mainly on the mortality of the whole population. In the present report reasons are given for regarding the rate of 1916 as about equal to the lowest rate hitherto recorded, provided that due allowance is made for the effect of enlistment on the population. The standardised mortality of males ordinarily exceeds that of females. Up to 1860 the excess was not more than 9 per cent., but in 1916, in consequence of the war, the excess amounted to 32 per cent. The most remarkable feature in the table for 1916 is the extraordinarily low death-rate in the first quinquennium of life. It was much lower than any previously recorded, and was less than half the rate prevailing in the concluding years of the last century. In 1916 the all-age mortality from enteric fever and from scarlet fever was the lowest on record; whilst diphtheria and influenza were more fatal than the average. But the death-rate from tuberculous diseases showed a further advance on the high rate of 1915; although the increase did not extend to young children, the mortality under five years being the lowest hitherto recorded. Cancer was more fatal in 1916 than in any other year, and cerebro-spinal fever continued to be abnormally destructive to life.

Statistics of early childhood.—In view of the necessity in war-time of safeguarding to the utmost the rising generation, and especially of protecting the diminishing number of new lives still produced, it is a significant and hopeful feature of this report that the mortality of young children has been substantially reduced. Accordingly, more space than usual has been there devoted to the statistics of early childhood. As regards sex-incidence, the births in England and Wales in 1916 were in the proportion of 1049 males to 1000 females, against 1038 to 1000 in the preceding five years. It will only be possible after the war to determine to what extent the old idea that war conditions lead to male conceptions has been justified by the huge experiment now in progress. But it can hardly be dismissed as a mere accident that by far the highest proportion recorded during the last half-century should have characterised the first year entirely subject, in this respect, to the influences of war.

Infant mortality.—Of the deaths at all ages, 14·1 per cent. were those of infants under the age of 1 year. These deaths correspond to a mortality rate of 91 per 1000 births, the lowest ever recorded. It was below the average in the preceding decennium by 20 per cent. This decline was in part due to low diarrhœal fatality, but the greater part of it is accounted for under other diseases less subject to climatic influences, and therefore gives better promise of permanence. The London rate of infantile mortality has exceeded that of the whole country in one year only out of the last six years. This fact is remarkable and full of hopeful import, since it proves that there is nothing in urban life *per se* to prevent a further large reduction of the rate. If in the year 1916 this had been no higher in the other manufacturing towns

[1] The Registrar-General's Seventy-ninth Annual Report.
[2] THE LANCET, 1917, i., 464.

than in London the general rate of England and Wales would have been 86 instead of 91, as it actually was. But the connexion between "urbanisation" and infant mortality is so close as to suggest that, if equal pains were taken elsewhere, the rate for the county boroughs would be appreciably below that of London.

Great as has been the progress of the past 16 years it is now evident that much remains to be done if the conditions in the rest of the country are to approximate to those of the metropolis; and the figures now available convey no suggestion that such a standard is approaching finality. At birth the chances of survival differ but little in town and country, but the noxious effects of urban life soon come into play. They make themselves felt to an increasing extent as the first year of life progresses, and to a still more serious extent in the second and third years of life, when the urban excess approaches 100 per cent.

The chief causes of infant mortality are set forth in the text. From all causes loss of life among infants declined in 1916, the chief reductions being under the head of infectious diseases and diarrhœa. The rate ascribed to tuberculosis, 2·39 per 1000 births, is much the lowest on record, the fall being appreciable under each variety of that infection. The important, but unsatisfactory, group of *wasting diseases* likewise shows a decrease, the rate being the lowest yet recorded.

Mortality among young children.—The causes of decline in mortality at age 0–5 years are included under the head of infant mortality, because 65 per cent. of the deaths under 5, in 1916, occurred during the first year of life. The decline in the subsequent four years of childhood is, nevertheless, of considerable importance. In the second year after birth the decline appears to have reached its maximum, after which it progressively diminishes, until at age 5–10 it assumes quite small proportions. At age 0–1 year the decline is similar to that stated for infant mortality. Indeed, the death-rate so computed is, in some respects, preferable to the ordinary infant mortality-rate, for it gives the ratios at this age in a form comparable with those at other ages, whereas infant mortality has the effect of minimising the loss of life at this age when similarly compared. On examining the cause of the decline of the death-rate at 1–5 years, much of it is accounted for under the head of measles and its complications. From measles, pneumonia, and diarrhœa together 90 per cent. of the total fall was attributable in the year under notice. The only cause showing serious increase was diphtheria, which was somewhat more fatal than in the preceding quinquennium.

URBAN VITAL STATISTICS.

(Week ended March 30th, 1918.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality was 16·1, against 16·6 and 16·5 per 1000 in the two preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 16·7, or 0·2 per 1000 below that recorded in the previous week; among the remaining towns the rates ranged from 5·9 in Smethwick, 7·7 in Southend-on-Sea, and 8·3 in Hastings to 24·1 in Great Yarmouth, 32·5 in St. Helens, and 38·2 in Barnsley. The principal epidemic diseases caused 607 deaths, which corresponded to an annual rate of 1·9 per 1000, and included 256 from whooping-cough, 246 from measles, 48 from diphtheria, 35 from infantile diarrhœa, 14 from scarlet fever, and 8 from enteric fever. Measles caused a death-rate of 3·1 in Leeds, 3·5 in Bristol, 4·4 in Oxford and in Great Yarmouth, 5·2 in Swindon, and 14·8 in Barnsley; whooping-cough of 1·8 in Middlesbrough, 1·9 in Bolton, 2·1 in Merthyr Tydfil, and 5·2 in Carlisle; scarlet fever of 1·7 in St. Helens; and diphtheria of 1·7 in St. Helens and 2·3 in Middlesbrough. The 947 cases of scarlet fever and 1547 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were 9 and 35 below the respective numbers remaining at the end of the previous week; there were also 30 cases of small-pox, including one new case admitted during the week. Of the total deaths in the 96 towns 148 resulted from violence. The causes of 43 deaths were uncertified, of which 9 were registered in Birmingham, 7 in Liverpool, and 3 each in Preston and Hull.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality was 14·6, against 13·9 and 16·3 per 1000 in the two preceding weeks. The 309 deaths in Glasgow corresponded to an annual rate of 14·5 per 1000, and included 16 from whooping-cough, 8 from measles, 4 from infantile diarrhœa, and 3 from diphtheria. The 81 deaths in Edinburgh were equal to a rate of 12·7 per 1000, and included 2 from diphtheria and 1 each from scarlet fever and infantile diarrhœa.

Irish Towns.—The 155 deaths in Dublin corresponded to an annual rate of 20·3, or 7·5 per 1000 below that recorded in the previous week, and included 5 from whooping-cough, 4 from infantile diarrhœa, 2 from measles, and 1 from enteric fever. The 177 deaths in Belfast were equal to a rate of 23·5 per 1000, and included 14 from whooping-cough, 7 from measles, 2 from infantile diarrhœa, and 1 from enteric fever.

THE SERVICES.

ARMY MEDICAL SERVICE.

THE undermentioned Major-Generals are placed on retired pay: F. J. Jencken, C.B., H. G. Hathaway, C.B.

Lieut.-Col. A. J. MacDougall to be temporary Colonel whilst employed as Assistant Director of Medical Services of a Division.

Temp. Lieut.-Col. A. G. Phear to be temporary Colonel.

ROYAL ARMY MEDICAL CORPS.

Major J. A. Masters (retired list), R.A.M.C., is granted the honorary rank of Lieutenant-Colonel.

The undermentioned to be acting Lieutenant-Colonels whilst in command of a Medical Unit: Major G. W. Heron, D.S.O., Major G. A. K. H. Reed, Capt. C. McQueen, M.C., Temp. Capt. R. C. Phelps, Major C. W. O'Brien, Major A. L. Otway, Temp. Capt. K. W. MacKenzie, M.C., Capt. A. Irvine-Fortescue.

Capt. A. L. Urquhart to be acting Major whilst in command of a Medical Unit.

Temp. Lieut.-Col. (Major and Brevet Lieut.-Col., R.A.M.C., T.F.) C. H. Fagge relinquishes his temporary commission on re-posting.

Lieut.-Col. J. F. Donegan, C.B., is placed on retired pay.

Temp. Major (Capt., R.A.M.C., T.F.) A. W. Falconer, D.S.O., to be temporary Lieutenant-Colonel.

C. B. Heald (temporary Major, R.A.M.C.) is granted a temporary commission as Lieutenant-Colonel.

Temp. Capt. G. H. Ward-Humphreys to be temporary Major whilst specially employed.

S. R. Scott to be temporary Major.

Lieutenants (temporary Captains) to be Captains: G. D. Harding, A. M. McCutcheon, J. A. Andrews, M.C., R. C. Robertson, M.C., H. H. Mulholland, A. C. Jebb, J. A. W. Ebden, E. B. Marsh, A. L. Aymer, J. H. Pendered, M.C., A. N. Minns, D.S.O., M.C., W. W. McNaught, J. P. Litt, H. A. Harbison, M.C., W. G. Shakespeare.

Temporary Lieutenants to be temporary Captains: K. G. Colquhoun, J. S. Byrne, A. W. C. Bennett, O. H. Bulloch, D. N. Anton, P. McL. Shiels, R. D. Passey, A. F. Campbell, H. Cardin, F. D. Crew, E. W. Goble, R. G. Hill, L. R. G. de Glanville.

F. W. Martin and R. V. Steele (late temporary Captains) are granted the honorary rank of Captain.

Officers relinquishing their commissions: Temp. Capts. C. F. Dillon-Kelly, L. C. Dillon-Kelly, G. D. Compston, C. H. MacLean (on account of ill-health contracted on active service, and is granted the honorary rank of Captain), C. A. R. Nitch, T. J. Burton, H. J. Cooper, A. B. Simpson, A. McL. Pilcher (and to be granted the honorary rank of Captain), W. C. W. Glenny, J. R. MacCulloch (on account of ill-health, and is granted the honorary rank of Captain). Temp. Lieuts. W. A. Clement, J. M. Dickson, G. T. Watson, E. Whalley, R. J. Lytle, W. Venis, J. Good, A. G. Harvey, J. P. Ryan, M.C., R. M. Danks, J. N. Beadles, M. Munro, T. T. M. Dishington, A. C. S. Waters, A. J. Macleod, A. W. Hare, H. W. James (on account of ill-health, and is granted the honorary rank of Lieutenant). Temp. Hon. Lieut. J. D. Milne.

Canadian Army Medical Corps.

Temp. Capt. (acting Major) W. C. Laidlaw to be temporary Major.

Temp. Major H. L. Burris to be temporary Lieutenant-Colonel.

Temporary Captains to be temporary Majors: F. H. Watts, N. C. Sharpe, (acting Major) R. G. Armour, A. A. MacKay.

R. A. Hughes to be temporary Captain.

SPECIAL RESERVE OF OFFICERS.

Major J. Clerke relinquishes the acting rank of Lieutenant-Colonel on re-posting.

Capt. W. C. Borrie relinquishes his commission on account of ill-health.

To be Lieutenants: T. L. Crawhall (from Durham University Contingent, O.T.C.), C. D. Pullan (from Leeds University Contingent, O.T.C.).

Lieut. H. L. Mooney relinquishes his commission on account of ill-health.

TERRITORIAL FORCE.

Major G. Hall, C.M.G., to be acting Lieutenant-Colonel whilst in command of a General Hospital, and is seconded whilst so employed.

Major (Brevet Lieut.-Col.) C. H. Fagge is restored to the establishment.

Major A. H. Hogarth, from T.F.R., to be Major.

Major D. L. Todd to be acting Lieutenant-Colonel whilst commanding a General Hospital.

Major (temp. Lieut.-Col.) A. C. Goodwin relinquishes his temporary rank on ceasing to command a Field Ambulance.

Major F. D. Boyd, C.M.G., is seconded.

Capt. (temp. Major) P. Howie relinquishes his temporary rank on an alteration in posting.

Capt. C. S. Brown relinquishes his commission on account of ill-health, and is granted the honorary rank of Captain.

Capt. (Brevet Major) C. N. Draycott relinquishes his commission on account of ill-health and is granted the honorary rank of Captain.

Captains to be acting Majors whilst commanding sections of Field Ambulances: W. Bowater, D.S.O., K. A. P. R. Murray, A. E. P. McConnell, C. E. K. Herapath, M.C., H. J. D. Smythe.

Capt. J. R. Mitchell relinquishes his commission on account of ill-health and is granted the honorary rank of Captain.

Capt. J. M. Whyte is seconded for duty with a General Hospital.

Capt. J. D. L. Currie relinquishes his commission on account of ill-health, and is granted the honorary rank of Captain.

Capt. H. G. L. Haynes to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

R. A. Clegg (late Lieutenant, Lincolnshire Regiment) to be temporary Lieutenant, Lincolnshire Medical Volunteer Corps.

C. L. Pattison (late Lieutenant R.A.M.C.) to be Medical Officer and temporary Captain, 5th Group, West Riding Motor Volunteer Corps.

TERRITORIAL FORCE RESERVE.

Major (temporary Lieutenant-Colonel) J. Nightingale from R.A.M.C., to be Major.

Capt. P. W. Young, from General Hospital, to be Captain.

Capt. J. A. Watt, from a Field Ambulance, to be Captain.

Capt. T. J. Mackie, from R.A.M.C., to be Captain.

The War.

ARMY MEDICAL ADVISORY BOARD.

THE Army Medical Advisory Board has been reconstituted as follows, on the expiration of the term of service of the former members :—

President.—Lieutenant-General T. H. J. C. Goodwin, C.B., C.M.G., D.S.O.

Members.—Major-General Sir B. E. Dawson, G.C.V.O., C.B.; Major-General Sir B. G. A. Moynihan, C.B., F.R.C.S.; Colonel W. H. Horrocks, C.B.; Colonel Sir R. Jones, C.B., F.R.C.S.; Lieutenant-Colonel Sir H. J. Stiles.

Secretary.—Mr. E. T. Gann.

THE CASUALTY LIST.

THE following medical officers appear among the casualties announced since our last issue :—

Killed.

Temp. Capt. E. H. Griffin, D.S.O., M.C., R.A.M.C., was educated at Guy's Hospital, London, and at Cambridge University, and qualified in 1902. He held an appointment at Venezuela and was surgeon to the British Red Crescent Society in the Italian-Turkish War, Tripolitania. The award of the D.S.O. was recorded in THE LANCET of Dec. 1st, 1917, p. 838; of a bar to the M.C. in THE LANCET of Sept. 1st, 1917, p. 360; and of the M.C. in THE LANCET of Sept. 2nd, 1916, p. 450.

Capt. C. H. G. Philp, R.A.M.C., attached Manchester Regiment, was a student at St. Thomas's Hospital, London, and qualified in 1912. He held appointments at St. Thomas's and at the Herefordshire General Hospital.

Capt. D. C. Crole, R.A.M.C., attached Hussars, qualified at Edinburgh in 1905, and was for a time house surgeon at the infirmary in that city. Later he proceeded to India.

Lieut.-Col. J. Robertson, R.A.M.C.

Capt. H. W. Batchelor, R.A.M.C., was educated at the London Hospital, and qualified in 1912.

Capt. E. C. Cunnington, R.A.M.C., was educated at St. Bartholomew's Hospital, London, and at Cambridge, and qualified in 1915.

Accidentally Killed.

Capt. T. L. Enright, R.A.M.C., qualified in Ireland in 1914, and joined the R.A.M.C. early in the following year.

Died of Wounds.

Capt. H. H. Taylor, R.A.M.C., attached Royal Welsh Fusiliers, was educated at St. Mary's Hospital, London, and at Cambridge University, and qualified in 1907.

Capt. G. H. D. Webb, R.A.M.C., attached Dragoon Guards, was a student at University College Hospital, London, and qualified in 1914.

Died.

Lieut.-Col. R. Bird, M.V.O., C.I.E., I.M.S., qualified in 1888, and after holding an appointment at St. Bartholomew's Hospital, London, he joined the Indian Medical Service, and was for some time professor of surgery at the Medical College, Calcutta.

Wounded.

Lieut. H. Daw, R.A.M.C.
Col. H. B. Fawcus, C.M.G., D.S.O., R.A.M.C.
Capt. W. J. Knight, M.C., R.A.M.C., attached Hamps. Regt.
Capt. W. F. McLean, R.A.M.C.
Capt. T. J. Ryan, R.A.M.C.
Lieut.-Col. J. MacMillan, M.C., R.A.M.C.
Capt. J. McI. Morgan, M.C., R.A.M.C.
Col. A. D. Sharp, C.B., C.M.G., R.A.M.C.
Surg. J. J. Keatley, R.N.
Capt. G. S. Clancy, R.A.M.C., attd. Royal Warwick Regt.
Capt. H. E. S. Richards, R.A.M.C.
Capt. L. M. Webber, R.A.M.C., attached Lincs. Regiment.
Capt. V. H. Mason, M.C., R.A.M.C.
Capt. S. A. W. Munro, R.A.M.C., attached Seaforth Highrs.
Capt. P. A. Earnshaw, Australian A.M.C.
Capt. P. J. O'Shea, M.C., Australian A.M.C.
Capt. E. C. T. Emerson, R.A.M.C.
Capt. H. L. G. Hughes, D.S.O., R.A.M.C., attd. Wilts Regt.
Capt. R. N. Porritt, R.A.M.C., attached Royal Berks Regt.
Capt. J. W. Hunt, Canadian A.M.C.
Capt. R. S. Ross, R.A.M.C., attached R.F.A.
Capt. C. D. S. Agassiz, M.C., R.A.M.C.
Capt. S. W. Fisk, R.A.M.C., attached Welsh Guards.
Lieut. E. A. Sanders, R.A.M.C., attached Labour Corps.
Capt. W. Smith, M.C., South African Medical Corps.

Missing.

Capt. W. Arnott, R.A.M.C.
Capt. M. T. Ascough, R.A.M.C.
Capt. T. E. A. Carr, R.A.M.C.
Capt. W. M. Christie, R.A.M.C., attached S. Staff. Regiment.
Capt. G. R. Lipp, M.C., R.A.M.C., attached N. Staff. Regt.
Major J. S. McConnachie, R.A.M.C.
Capt. A. T. I. MacDonald, R.A.M.C.
Capt. D. MacNair, R.A.M.C., attached Sherwood Foresters.
Capt. C. Mearns, R.A.M.C., attached Sherwood Foresters.
Lieut. W. H. Rowden, R.A.M.C.
Capt. P. B. Corbett, R.A.M.C., attached Northumberland Fusiliers.
Capt. S. Cross, R.A.M.C., attached Suffolk Regiment.
Capt. C. E. P. Husband, R.A.M.C., attached Northumberland Fusiliers.
Capt. E. J. Storer, attached Essex Regiment.
Capt. G. Torrance, R.A.M.C.
Capt. D. A. Wilson, R.A.M.C.
Capt. F. T. H. Davies, R.A.M.C., attd. Sherwood Foresters.

OBITUARY OF THE WAR.

THOMAS FORREST CRAIG, M.B., CH.B. EDIN.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain T. F. Craig, who died on Feb. 2nd last as a result of wounds received on active service, aged 38 years, was second son of the late Rev. A. M. Craig, M.A., and was educated at Kelso High School. First qualifying as a chemist he was some years with Messrs. Duncan, Flockhart, and Co., of Edinburgh, before entering on his medical studies. He took the degrees of M.B., Ch.B. at Edinburgh University in 1910, was house surgeon to the Whitehaven Infirmary, and then became assistant to Dr. J. W. Crerar at Maryport. Subsequently he took charge, for long periods, of practices in Berwickshire and the West Riding of Yorkshire. In June, 1915, he joined the R.A.M.C. and after a period at home as regimental medical officer saw service in Malta and Flanders. Last summer, after working in a general hospital at Alexandria, he was posted to the field ambulance of the mounted corps of the Palestine Expeditionary Force, and on Nov. 28th was severely wounded through the chest while in the act of tending a wounded officer. He recovered sufficiently to be sent home, but on board the hospital ship had a relapse, and died at sea.

One who worked with Captain Craig writes of his half-humorous, half-cynical, but always kindly, outlook on life, the expression of a mind of ingenious and philosophic bent. Always a keen student of literature, and especially that of the Scottish writers, he helped while at Edinburgh to found *The Gambolier*, an unofficial student's magazine, to which he contributed freely both in prose and poetry. These characters combined with great devotion to his patients make his loss keenly felt.

ST. CLAIR DUNN, M.D. MANITOBA,

CAPTAIN, CANADIAN ARMY MEDICAL CORPS.

Captain St. C. Dunn, whose death at the front has recently been reported, was born at Atwood, Ontario, in December, 1880, graduating at the age of 28 years from the Medical School of the University of Manitoba. After graduation he settled in practice at Gimli. Joining the Canadian Army Medical Corps as battalion medical officer, he remained attached to his unit for 18 months, crossing with it to England in 1916. In the following spring he was transferred to a reserve battalion in England, and last autumn went overseas with a field ambulance, to which he was attached at the time of his death. Captain Dunn leaves a widow.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported:—

Lieut. W. R. Hall, M.C., Suffolk Regiment, killed in action, youngest son of Dr. H. S. W. Hall, of Hertford.

Cadet J. R. N. Wright, R.N., died at the R.N. College, Osborne, son of Dr. S. R. Wright, of Romford, Essex.

Second Lieut. E. F. Henderson, The Buffs, killed in action, second son of Dr. E. E. Henderson, of Lower Berkeley-street, London.

Lieut.-Col. O. C. S. Watson, D.S.O., Yorkshire Regiment, killed in action, youngest son of the late W. S. Watson, F.R.C.S., of Kensington, London.

Second Lieut. S. S. Gemmell, Cameron Highlanders, killed in action, youngest son of Dr. J. E. Gemmell, of Liverpool.

Capt. A. M. Craigmile, M.C., Rifle Brigade, killed in action, eldest son of Dr. A. Craigmile, of Wallasey, Cheshire.

Capt. F. K. Cummins, Connaught Rangers, killed in action, youngest son of Professor W. E. A. Cummins, of Cork.

Second Lieut. H. E. Skrimshire, Royal Garrison Artillery, died of wounds, younger son of the late Dr. F. W. Skrimshire, of Morpeth, Northumberland.

Capt. A. J. Williams, King's Royal Rifle Corps, killed in action, youngest son of the late Dr. Williams, of Much Hadham, Herts.

Capt. H. W. Batchelor, R.A.M.C., killed in action, eldest son of the late Dr. H. T. Batchelor, of Queenstown, Cape Colony.

Capt. C. P. G. Gordon, South Staffordshire Regiment, attached R.F.C., accidentally killed while flying in England, only son of Col. P. C. H. Gordon, A.M.S.

Second-Lieut. J. E. T. Haynes, Worcester Regiment, killed in action, only child of Dr. S. Haynes, of Edgbaston, Birmingham.

Capt. M. M. O'Keefe, M.C., Royal Field Artillery, killed in action, only son of Major-General M. W. O'Keefe, A.M.S., of Shooters Hill, Kent.

Capt. H. N. Wegg, Middlesex Regiment, killed in action, younger son of the late Dr. William Wegg, of Mayfair, London.

Lieut. P. W. Newington, The Buffs, killed in action, son of Dr. C. W. H. Newington, of Edenbridge, Kent.

THE HONOURS LIST.

The following are the statements of service for which the decorations recorded in THE LANCET of Dec. 1st, 1917, p. 838, were conferred. All are members of the R.A.M.C. unless otherwise stated:—

Bar to the Distinguished Service Order.

Major (Temp. Lieut.-Col.) Patrick John Hanafin, D.S.O.
For conspicuous gallantry and devotion to duty. For nine days he was continuously under heavy shell fire while supervising the evacuation of the wounded in the most adverse circumstances. Finally, although wounded in passing through a heavy barrage, he continued on duty until the last man had been brought in. The successful evacuation of the wounded was largely due to his gallant conduct.

Temp. Capt. Robert McCowan Hill, D.S.O.
For conspicuous gallantry and devotion to duty. While on the way to battalion headquarters his party was caught in an enemy barrage and four of them wounded. He at once dressed their wounds on the spot in a most exposed position and under heavy fire. On arriving at the aid-post he was informed that a whole machine-gun team were casualties in an advanced position. No stretcher-bearers were available, and he at once went forward and attended to them on the spot under heavy fire. He then returned and worked at his aid-post under intense shelling, often attending to cases in the trench outside when the aid-post was full. Casualties were being caused all round him, and he was wounded himself, but, though suffering severely, he remained at duty for 16 hours until the battalion was relieved. He set a most inspiring example of courage and devotion to duty to all ranks.

Distinguished Service Order.

Major William Bannerman Craig, Australian A.M.C.
For conspicuous gallantry and devotion to duty during an attack. After the aid-post had been blown up he attended the wounded and organised bearer parties in the open. Though wounded, he persisted in his work until disabled by another wound.

Temp. Capt. James Churchill Dunn, M.C.
For conspicuous gallantry and devotion to duty during an attack. He worked with untiring energy in the open in the front line, searching for and dressing the wounded and constantly exposing himself to machine-gun and rifle fire. His medical orderlies were both wounded, and the greater portion of his work was done without any assistance. He set a magnificent example to all of courage and devotion to duty under continuous heavy fire and enemy counter-attacks.

Temp. Capt. Ernest Harrison Griffin, M.C.
For conspicuous gallantry and devotion to duty. He established his dressing station well forward during an attack, and went up to the front line through a storm of artillery and machine-gun fire, utterly regardless of personal safety. He moved about in the open for 36 hours without food or rest, attending to the wounded, often leading parties of bearers through heavy barrages until every wounded man had been carried back. He remained behind after the battalion was relieved, still searching for wounded, under heavy fire, though he was several times badly shaken by the explosion of shells. He set a most inspiring example of courage and devotion to duty.

Major William Allan Hailes, Australian A.M.C.
For conspicuous gallantry and devotion to duty in attending to four wounded men in the open under heavy fire and conveying them to cover. His example stimulated the stretcher-bearers to great efforts under most trying circumstances.

Major Harrie Bertie Lee, M.C., Australian A.M.C.
For conspicuous gallantry and devotion to duty. He was in charge of the organisation of bearer reliefs during an action, and hearing that the officer in charge of the forward bearer parties had been killed, he at once went forward under heavy fire and took charge. He located the new regimental aid-posts forward of the former front line, and with absolute disregard of danger arranged for the evacuation of the wounded from these new posts through a heavy barrage. His quick grasp of the situation and prompt and courageous action were of inestimable value.

Major Kenneth MacCormick, New Zealand M.C.
For conspicuous gallantry and devotion to duty when in charge of the evacuation of the wounded during an action. He remained at duty for 48 hours without rest, visiting the advanced posts, searching shell-holes, and bringing in many wounded. When one of his bearer posts was heavily shelled, with great coolness he got all the wounded away, staying behind himself until the last had left. He set a splendid example of courage and untiring energy.

Major Robert Maxwell McMaster, Australian A.M.C.
For conspicuous gallantry and devotion to duty in tending the wounded continuously for ten hours under shell-fire. Several of his bearers were killed and wounded, and it was only with the greatest difficulty that he was able to save the wounded from being killed or buried alive.

Capt. and Bt.-Major Henry Forbes Panton, M.C.
For conspicuous gallantry and devotion to duty. The evacuation of casualties, amounting to 60 officers and 1100 men, after an advance of 3000 yards was most successfully carried out, chiefly owing to the initiative and sound judgment displayed by him. He spent 24 hours in the forward area, visiting every regimental aid-post and sending back hourly reports until the battlefield was completely cleared of wounded.

Bar to the Military Cross.

Temp. Capt. William Thomson Brown, M.C.
For conspicuous gallantry and devotion to duty. He acted as bearer officer during an action, and was continuously in the open under heavy fire of all kinds. Though several times blown up by shells, he remained at work, and set a most inspiring example of courage and gallantry.

Temp. Lieut. (Temp. Capt.) Henry Alphonsus Harbison, M.C.
For conspicuous gallantry and devotion to duty. He was in charge of divisional stretcher-bearers during several days' operations. For 72 hours he never slept, and was continually on the move under intense shell fire, establishing connexion with the regimental aid-posts and leading and directing the bearers. The entire success of the evacuation of stretcher cases from the forward area was due to his magnificent example. His coolness, courage, and endurance had a wonderful influence on his bearers. He has rendered conspicuous and valuable service on many other occasions.

Temp. Capt. Charles Reginald Ralston Huxtable, M.C.
For conspicuous gallantry and devotion to duty. This officer worked for three days and nights under the most appalling conditions helping the wounded, being continually in the greatest danger. He finally collapsed on reaching camp.

Capt. Charles Herbert Leedman, M.C., Australian A.M.C.
For conspicuous gallantry and devotion to duty. He worked for four days in the open attending to the wounded, in the course of which he dressed 300 cases. Seven intense barrages were put down by the enemy, but he went on with his duties, showing a total disregard for danger. His courage, devotion to duty, and endurance, greatly inspired all ranks, and undoubtedly saved many lives.

Capt. George Reginald Edward Gray Mackay, M.C.
For conspicuous gallantry and devotion to duty in personally supervising the evacuation of the wounded, making several journeys through a heavy barrage. On many previous occasions he has performed similar acts of gallantry.

Temp. Capt. Charles Joseph O'Reilly, M.C.
For conspicuous gallantry and devotion to duty in personally supervising the evacuation of wounded, passing and repassing through heavy barrage fire. When a neighbouring M.O. was killed he attached himself to the battalion and dressed and supervised the evacuation of the wounded.

Capt. Patrick Joseph Francis O'Shea, M.C., Australian A.M.C.
For conspicuous gallantry and devotion to duty. He dressed the wounded in the open after the aid-post had become congested and organised stretcher parties under heavy fire. His resource and courage saved many lives. He afterwards went round the shell-holes with a party of bearers dressing and collecting the wounded with a fine disregard of personal danger.

Temp. Capt. John Finlayson McGill Sloan, M.C.
For conspicuous gallantry and devotion to duty. He worked continuously for two days dressing over 150 cases in the open under heavy fire, three or four of the wounded being hit by snipers. He showed a fine example of coolness and sense of duty.

Temp. Capt. Gideon Walker, M.C.
For conspicuous gallantry and devotion to duty. He worked for 24 hours after an attack in an advanced area getting in the wounded of two battalions and remained in the line after his own battalion was relieved. He showed the greatest contempt of danger under heavy shell fire.

The Military Cross.

Capt. William Norman Abbott, New Zealand A.M.C.
For conspicuous gallantry and devotion to duty. He was untiring in his efforts in attending to the wounded under heavy fire during an attack. He worked without rest for 72 hours, and set a magnificent example to all.

Capt. Douglas Lewis Barlow, Australian A.M.C.
For conspicuous gallantry and devotion to duty during an attack. He advanced with the battalion, established his aid-post, and dressed the wounded and assisted in their removal under constant shelling. Owing to casualties among bearers he was cut off from the ambulance clearing-post for several hours, and it was mainly owing to his exertions that the wounded received attention and shelter during this period.

Capt. Charles Henry Brennan, Spec. Res.
For conspicuous gallantry and devotion to duty. He led his bearers fearlessly through heavy shell fire, and made a most valuable reconnaissance beyond the regimental aid-post to find out if there were any wounded lying out. Though blown up and gassed, he remained at duty, setting a magnificent example to all.

Capt. John Herald Balfour Brown, Australian A.M.C.
For conspicuous gallantry and devotion to duty when in charge of the forward line of evacuation for eight hours after his commanding officer was wounded. His reconnoitring of ambulance-posts and regimental aid-posts through the area of shell fire was of great assistance in controlling the evacuation. He supervised the loading of wounded into horse ambulances and organised the line of bearers and prisoners, and it was due to his action that great congestion was prevented.

Temp. Lieut. (Temp. Capt.) Raymond John Clausen.
For conspicuous gallantry and devotion to duty. He worked continuously for 48 hours, directing the stretcher-bearers and attending to the wounded under continuous shell fire. His cool courage and indomitable energy inspired his men and helped to save many lives.

Capt. George Crawshaw.
For conspicuous gallantry and devotion to duty. His aid-post was twice blown up, but he continued at his work in the open, attending to the wounded under heavy fire with utter disregard of his own safety. He set a magnificent example of courage and devotion to duty.

Temp. Capt. Douglas Erith Derry.
For conspicuous gallantry and devotion to duty. While he was posting stretcher-bearers the locality was very heavily shelled, and many men were wounded, but he succeeded in dressing and removing them all under heavy fire. Later, in a small dressing station, when the shelters were hit and damaged by shell fire, he showed a splendid example to all by his coolness and resource.

Temp. Capt. Thomas Duncan.
For conspicuous gallantry and devotion to duty. Though he was wounded on the way up to the line before an attack, he refused to go back, and carried out his duties under most difficult conditions, and though suffering considerable pain, throughout the operations. He was again wounded, but continued at work until ordered to have his wounds attended to.

Capt. Fred Ellis.
For conspicuous gallantry and devotion to duty. He was in charge of stretcher-bearers during an action, and owing to his fearless and capable handling of his men the evacuation of the wounded was carried out with great success and rapidity. He remained in the open for long periods superintending the work. His disregard of danger and devotion to duty were of the highest order.

Temp. Capt. Andrew Gaston.
For conspicuous gallantry and devotion to duty during an attack. He was untiring in his efforts to attend to the wounded under heavy shell fire, and personally brought in many wounded men, often dressing their wounds first in the open. His courage inspired all the wounded with confidence, and proved the finest example to his stretcher-bearers.

Capt. Stuart Galloway Gibson, Australian A.M.C.
For conspicuous gallantry and devotion to duty. While he was in charge of a detachment at a loading-post the enemy opened a heavy bombardment. Though nearly all the shelters were demolished, he continued at his work of removing casualties throughout intense shelling. He set a splendid example of courage and devotion to duty.

Capt. William Evans Graham.
For conspicuous gallantry and devotion to duty when in charge of stretcher-bearers. By his utter disregard of danger he set a splendid example to his men, and carried out the evacuation of the wounded under heavy and continuous shell fire until he was severely wounded.

Temp. Capt. John Lewis Anderton Grout.
For conspicuous gallantry and devotion to duty in conducting a number of stretcher squads through very heavy shell fire to the aid-posts after they had previously failed to get through. Two bearers were killed and three wounded, but by his gallant action over forty stretcher cases were got to safety. Later he personally conducted squads to these aid-posts under similar circumstances.

Temp. Lieut. Henry John Henderson.
For conspicuous gallantry and devotion to duty. He established his aid-post within 300 yards of the enemy's position, and dressed and evacuated cases in the open. It was due to his splendid example, cheerfulness, and courage that a great number of lives were saved.

Capt. Charles Edward Kynaston Herapath.
For conspicuous gallantry and devotion to duty. During two attacks he was in charge of the evacuation of the wounded from the regimental aid-posts. On both occasions he moved about from post to post under very heavy shell fire, encouraging the stretcher-bearers and organising the evacuation. It was largely owing to his conduct and example that 1000 cases were got away successfully.

Capt. Frederick William Kemp, New Zealand A.M.C.
For conspicuous gallantry and devotion to duty. He was untiring in his efforts in attending to the wounded under heavy fire during an attack. He worked without rest for 72 hours, and set a magnificent example to all.

Capt. David Mackie, Spec. Res.
For conspicuous gallantry and devotion to duty when in charge of a line of evacuation. For four days he worked continuously in the open, going through heavy barrages.

Temp. Capt. John Charsley Mackwood.
For conspicuous gallantry and devotion to duty. He attended to the wounded of 11 units in the open under heavy shell fire, working single-handed for several days. His self-sacrificing devotion to duty and his thoughtfulness and care of the wounded were beyond all praise.

Temp. Capt. William Strelley Martin.
For conspicuous gallantry and devotion to duty in leading his bearers during seven days' operations through the most intense shelling with infinite resource and regardless of personal safety. It was due to his masterly organisation and example that the wounded were collected so promptly.

Temp. Capt. John Louis Menzies.
For conspicuous gallantry and devotion to duty in working continuously for 36 hours dressing and collecting wounded in the open under shell fire. When forced to take refuge his shelter was blown in and he himself badly shaken and only saved by his steel helmet. He remained at his post, however, until relieved in the ordinary course.

Temp. Capt. James Bertram Mitton.
For conspicuous gallantry and devotion to duty. When in charge of stretcher-bearers, by his courage and example he was able to get many wounded men away. The district was almost continuously under heavy shell fire and the roads were in a very bad condition, but he overcame all difficulties in a most praiseworthy manner and set a splendid example of courage and self-sacrifice.

Temp. Capt. John Henry Morris-Jones.
For conspicuous gallantry and devotion to duty. He carried on his duties at his aid-post during an enemy attack under very heavy fire. He also visited wounded men who were lying out in the heaviest of the fire, and went up to the front line to attend to the wounded. He showed total disregard of his own safety, and encouraged all by his cheerful and courageous demeanour.

Temp. Capt. Joseph Herbert Porter.
For conspicuous gallantry and devotion to duty. He was in charge of the divisional collecting-post during an action, and by his example and thoroughness did much to encourage all ranks in the discharge of their duties. He went forward in charge of bearers, and by his untiring energy succeeded in getting his communications re-established in the face of great difficulties.

Temp. Capt. Norman Pallister Pritchard.
For conspicuous gallantry and devotion to duty when in charge of his aid-post during operations. It was entirely owing to his untiring care of the wounded and exertion in marshalling stretcher-bearers that all were eventually evacuated and lives saved thereby. Most of his work was done in the open under observed machine-gun fire.

Capt. James Purdie, Spec. Res.
For conspicuous gallantry and devotion to duty. When he was informed that there were a number of wounded in the front line during an action, he at once went forward with his stretcher-bearers, under heavy fire, and remained in the front dressing and collecting the wounded until all were cleared. He set a fine example of courage and devotion to duty.

Capt. James Rafter, Spec. Res.
For conspicuous gallantry and devotion to duty in dressing wounded and organising stretcher-bearers in the open under heavy shell fire during four days' operations without relief. By his splendidly sustained effort he undoubtedly saved many lives and much suffering.

Capt. Stanley Arthur Railton, Australian A.M.C.
For conspicuous gallantry and devotion to duty. During a very heavy barrage and an enemy counter-attack he attended to the wounded in the open, with complete disregard for his own safety. His courage and coolness in carrying on his work under such conditions resulted in the saving of many lives.

Temp. Capt. Alan Randle.
For conspicuous gallantry and devotion to duty. He went forward during an action and personally cleared the battle-field of wounded, evacuating 120 cases in two hours under heavy shell fire. He showed great courage when casualties were caused by a bombardment during a relief.

Capt. Edmund Lewis Reid, South African A.M.C.
For conspicuous gallantry and devotion to duty. He accompanied the battalion in the attack, and attended to the wounded with magnificent fearlessness under heavy fire in the open. He visited and attended to cases in the front line, and it was largely due to his efforts that the wounded were quickly dressed and cleared. His courageous conduct saved many lives.

Capt. Hugh Arthur Sandiford.
For conspicuous gallantry and devotion to duty. He took up a position immediately behind the front line during an attack, and dressed the wounded in the open. He displayed great coolness and gallantry under heavy artillery fire, working in an exposed position for 48 hours.

Temp. Capt. William Logan Scott.
For conspicuous gallantry and devotion to duty. He worked untiringly, attending to the wounded in the open under heavy fire during an engagement, and showed splendid courage and resource.

Capt. Frederic Battinson Smith.
For conspicuous gallantry and devotion to duty. He worked in a shell-hole, attending to the wounded, throughout a very heavy bombardment. At night he frequently went out into No Man's Land with parties to bring in the wounded. He showed splendid courage and fearlessness.

Capt. Edwin Cyril Widmerpoole Starling, Spec. Res.
For conspicuous gallantry and devotion to duty. He remained day and night at his post under continuous shell fire, and was untiring in his work on behalf of the wounded, to whom his unremitting care and unruffled calmness was the greatest comfort and assistance. He set a splendid example of courage and self-sacrifice.

Temp. Capt. John Glyndor Treharne Thomas.
For conspicuous gallantry and devotion to duty. He established a forward dressing station in an advanced position during an action, and, though heavily shelled throughout the whole day, stuck to his post in a most courageous manner, and undoubtedly saved the lives of many men. He organised search parties, and himself carried in a number of badly wounded men under rifle and machine-gun fire.

Temp. Capt. John Aylmer Tippet.
For conspicuous gallantry and devotion to duty. When his dressing station was blown in, and nearly all the occupants killed, although much shaken, he immediately organised a new station and for eight hours dressed and tended the wounded without rest. Later, when the battalion moved forward, he went through a heavy barrage to the new dressing station and worked continuously for six hours. During five days he had practically no rest and dealt with some 300 casualties.

Capt. Adam Annand Turner.
For conspicuous gallantry and devotion to duty. He remained at duty for 48 hours under fire and without rest and succeeded in getting all the wounded away rapidly from the aid-posts and forward areas in spite of heavy enemy barrages. He set his men a splendid example of fearlessness and devotion to duty.

Temp. Capt. John Wilfred Watthews.
For conspicuous gallantry and devotion to duty. His evacuation of the wounded during and after attack was carried out with wonderful organisation and skill. He worked continuously for 48 hours attending to the wounded under hostile shell fire.

Capt. Harry Whitaker.
For conspicuous gallantry and devotion to duty. During an action he went forward and, in spite of heavy shell and machine-gun fire, searched out and dressed the wounded in the most advanced positions. When a counter-attack developed he refused to leave his post until all the wounded had been removed. His courage and devotion to duty were an inspiration to all ranks.

Temp. Capt. Henry Dewi Hampton Willis-Bund.
For conspicuous gallantry and devotion to duty. He was in charge of a dressing-station which was destroyed by shell fire. Though rendered unconscious, he continued to attend to the wounded in the open when he recovered, accompanied the battalion into action, and remained at duty for 48 hours. He showed the greatest courage and devotion to duty.

Capt. Eric William Beresford Woods, Australian A.M.C.
For conspicuous gallantry and devotion to duty. For several days he worked at his aid-post under very heavy shell fire, attending to all stretcher cases in the open with great courage and complete disregard of danger. His untiring energy and organisation saved many lives.

FOREIGN DECORATIONS.

Japanese.—Order of the Rising Sun: Fourth Class.—Fleet Surg. S. Conner, R.N.
Hellenic.—Order of the Redeemer: Commander.—Staff Surg. E. D. Rutherford, R.N.
French.—Croix de Guerre.—Surg. A. G. Williams, R.N.
Egyptian.—Order of the Nile: Fourth Class.—Capt. W. E. Marshall, M.C., R.A.M.C.; Capt. W. H. Milligan, R.A.M.C.

MENTIONED IN DESPATCHES.

In a despatch dated from Dar-es-Salaam, Jan. 21st, 1918, and dealing with the operations in East Africa, the following references to the medical and allied services occur:—

The Medical Services have had many, and at times almost insuperable, difficulties to contend with. Probably in no previous campaign in the tropics have such numbers been employed, and the peculiar conditions, as explained above, have rendered the evacuation of the large number of sick and wounded which had to be dealt with a most difficult problem. Transport of sick has been carried out by porters, motor ambulances, and mechanical transport, plying on the roughest roads, which necessarily at times involved much discomfort to the sick and wounded. Although the internal lines of communication have been long and difficult, the evacuation of sick has been well and expeditiously carried out from the front to the rail and sea bases, and every effort made to minimise the discomfort that might ensue. The mobility of the force has never been impaired by retention of sick at the front. Apart from the large number of wounded dealt with, the sick-rate from disease—namely, malaria and dysentery—has been excessive, and entailed large hospital provision to cope with it.

The Sanitary Services have had a most difficult task to keep in check the spread of severe infectious diseases—e.g., cerebro spinal meningitis and small-pox. These diseases are prevalent in many parts of the country, and liable to be introduced by carriers. Although always present in the force, they have been successfully controlled. The great number of carriers employed necessitated the formation of an elaborate medical organisation to deal with them, involving large hospital establishments. The medical arrangements for carriers have been most carefully considered and well carried out; extensive arrangements for their eventual repatriation have also been made.

An African Native Medical Corps, mainly recruited from Uganda, of natives of superior intelligence has been formed, and done excellent work in carrier hospitals and with East African troops.

The climate has been most trying to European and Indian troops, and even the African troops have suffered severely. The personnel of the Medical Services have suffered equally from climatic effects.

I cannot speak too highly of the enthusiasm and good work done by officers and men of the various Medical Services under the command of Surgeon-General G. D. Hunter, C.B., C.M.G., D.S.O., who have made every effort for the treatment, care, and comfort of the sick and wounded, at times under most exceptional and trying conditions.

The ladies of the various Nursing Services have shown the greatest devotion to duty, working at high pressure, regardless of climate and unusual surroundings; they one and all deserve the highest praise.

Correspondence.

"Audi alteram partem."

THE TREATMENT OF DISABLED SAILORS AND SOLDIERS IN CIVIL HOSPITALS.

To the Editor of THE LANCET.

SIR,—The honorary medical staff of this hospital has had under consideration a letter from the Medical Secretary, British Medical Association, dated Jan. 25th, with an appended memorandum of arrangements for the treatment of disabled soldiers and sailors sent to civil hospitals.

The staff is in agreement with the principle professed by the British Medical Association, that patients for whom the State is liable cannot expect to be treated as objects of charity, and that payment of the staff of hospitals in respect of these patients is desirable.

The staff, however, is further of the opinion that such payment should be adequate, and that any inadequate payment is highly undesirable; indeed, that no payment is desirable unless it is adequate.

When the proposed financial arrangements are examined it is found that this second principle, which the staff regards as of at least equal importance to the first, is not borne out in the proposed arrangements, and it is amazed that the British Medical Association should recommend them to the honorary staffs of voluntary hospitals as satisfactory.

Arrangements have already been made that ordinary medical attendance should be rendered to discharged disabled soldiers and sailors by panel and other general practitioners on an attendance basis at a rate which it is guaranteed will work out at about 1*s.* 11*d.* per attendance (at practitioner's house). This rate is in this area below the minimum rate of fees charged for private practice.

Cases sent to hospital may be presumed to be those needing expert advice such as is outside the competence of the general practitioner, and payment for medical attendance should surely be at least equal to that paid the general practitioner for ordinary attendance.

What, then, are the proposals recommended as satisfactory in the case of patients sent to voluntary hospitals, where the attendance given is often, if not usually, that of the consulting physician or surgeon or specialist?

1. In the case of in-patients, the sum allowed to cover all costs, both for medical attendance and maintenance, varies from 35*s.* to 49*s.* per week. Your proposal is that 10 per cent. of this should be paid to the staff fund. In other words, a payment is to be made of a sum varying from 3 6 to 4 10 and 4 5ths of a penny in respect of a week's skilled medical attendance, which *may include a major operation.*

2. In the case of out-patients, payment of all costs is to be made on a basis of the patient's attendance at a rate varying from 1*s.* to 2*s.* per attendance. Of this, the proposal of the British Medical Association is that 10 per cent. should be handed over for medical attention. In other words, the medical officer attending the case, who may be a consulting physician or surgeon or specialist, is to be paid at the splendid rate of 1 and 1 5th pence, or 2 and 2 5ths pence per consultation.

Yet the 6*d.* doctor is to be regarded as outside the pale of civilisation.

It may be said that out-patients' treatment may be largely given by nurses, and that attention by the medical man may not be necessary on every occasion. If the extreme case be taken of a patient attending for dressing daily, and seen by the doctor once a week, then his pay would rise to the giddy height of 8 and 2/5ths pence to 16 and 4/5ths pence per consultation.

When it is noted that Clause 6 of the Memorandum of Agreement further provides that—

"The authorities of the hospital undertake to keep an accurate record of the attendance and treatment of disabled men, to notify the local War Pensions Committee of the admission and discharge and out-patient attendance of all patients sent by them or by the Ministry of Pensions, and to furnish a certificate at the conclusion of treatment stating on medical opinion: (1) The general condition of the patient: (2) whether or not he needs further treatment which the hospital is not in a position to give, and if so, what kind of treatment—e.g., convalescent. The foregoing notifications and certificates to be covered by the inclusive capitation charge made for the attendance and treatment of patients";

and that Clause 10 provides for inspection by an officer of the staff of the Ministry of Pensions; and

"That the Hospital Committee of the Association has given considerable attention to this Memorandum, and with the approval of the Council now recommends to the honorary staffs of voluntary hospitals throughout the country that the terms offered in the Memorandum should be accepted as a satisfactory means of dealing with a new, difficult, and urgent problem"—

our only feeling is—Heaven defend us from our friends!

The honorary staff of this hospital does not regard the terms offered in the Memorandum as satisfactory, and has intimated to the House Committee of the hospital that it declines them, but that it is willing to treat discharged disabled soldiers as a charity pending an arrangement that it can accept with self-respect.

I am, Sir, yours faithfully,

W. A. EVELYN,

April 1st, 1918. Chairman of Medical Board, County Hospital, York.

ETHER CLONUS.

To the Editor of THE LANCET.

SIR,—In THE LANCET of Dec. 22nd, 1917, Dr. W. D. Anderson brings to our notice some cases of very distinct trembling which go by the name of ether clonus and occur during open-ether anæsthesia. Such cases would be met with in greater frequency among soldiers (3 in 41) than among civilians (5 in 1000), so much so that the author asks himself whether they might not be consequences of the nervous state due to modern war conditions. Mr. A. de Winter Baker in your issue of Jan. 5th, 1918, draws analogous conclusions from 3000 cases of ether anæsthesia during this war, but never saw any such accident when he gave ether by the semi-open method.

I had myself observed ether clonus cases several times during the Somme offensive (1916). For some time I had a record taken down by my anæsthetist in every case that passed under my care. On the 106 last anæsthesical charts I singled out 49 cases of ether anæsthesia given with the excellent Ombredanne apparatus and three cases of ether clonus. For two of the latter it was generalised clonus, and for the remaining one it was only localised clonus in wounded limbs (thigh and leg). The wounded men were 20, 25, and 31 years old respectively; one had been hit by shell fragments, another by a grenade, and the third by a bullet. In all three cases trembling only began after the patient was completely anæsthetised. Among the 57 remaining cases chloroform, ethyl chloride, or a mixture of both, was given; no case of clonus whatever. One of the patients had had convulsions during a first intervention with ether, but remained perfectly quiet in the course of a second one with chloroform. Moreover, three others presented, due to the use of ether, spasmodic coughing, accompanied in one case only with expectoration. On the other hand, one patient only grew agitated at the initial stage of ether sleeping, whereas such an incident occurred five times in the chloroform and ethyl chloride group.

Monier-Vinard[1] related two cases of wounded who had got cured from tetanus and underwent, in the course of further chloroformisations, tetanic convulsions. The latter lasted as long as the operation and ceased with the awakening. Alquier and Hagelstein[2] related the case of a man whose wound was situated on the external ankle-bone and who got a very distinct foot clonus during the operation. In connexion with that, P. Marie, Souques, Babinski, Meige, recalled that the foot clonus is common during surgical anæsthesia.

I am, Sir, yours faithfully,

HENRI VIGNES.

Groupement des Services Chirurgicaux et Scientifiques, de B——, S.P. 223.

THE PREVALENCE OF KELOID SCARS.

To the Editor of THE LANCET.

SIR,—I should like to ask those of your readers who have experience of convalescent camps and convalescent soldiers if keloid is a more frequent sequel of wounds to-day than formerly. And, if so, what is the possible explanation?

My experience of healed wounds has been a fairly extensive one as M.O. i/c of units, S.M.O. of a Provisional Brigade largely composed of returned B.E.F. men (2500 of whom I personally examined), registrar of a military hospital, president of standing medical boards in both Scotland and England, and latterly member of a T.M.B.; and the large percentage of scars exhibiting pronounced keloid has struck me very forcibly. Possibly the cases which have come before me have been the exception rather than the rule. The keloid scar being a particularly sensitive one when chafed by the equipment, it readily inflames and causes much suffering and disability. Our civilian experience associates this condition with burns and scalds rather than with post-operative and wound scars.

I have been wondering if the experience of other medical men handling these cases has been similar to my own. Comparing notes with numerous colleagues I find they are mostly in agreement with me, and various suggestions as to cause were advanced. Modern antiseptics, serum treatment (it is not uncommon after vaccination), and the "open" treatment of wounds in vogue necessitating healing by granulation are amongst the causes suggested. I did not notice it to any extent amongst the men wounded in the South African War.—I am, Sir, yours faithfully,

H. WAITE,

Surgeon-Major, R.A.M.C. (T.).

[1] Société de Neurologie, Paris, July 5th, 1917.
[2] Same Society, May 6th, 1915.)

UNILATERAL HYPERTROPHY OF MANDIBLE.

To the Editor of THE LANCET.

SIR,—A case of the above condition was recorded in THE LANCET of March 30th by Captain W. Edmond, R.A.M.C. It was interesting because no history of injury could be obtained. I have had three cases of (apparent) unilateral hypertrophy of the mandible resulting from gun-shot wounds. In all three cases the injury has been a small piece of shrapnel (about the size of a pea) lodged in the pterygo-maxillary fossa. In none of my cases has there been any sign whatever of infection—the wounds have healed by "first intention." There has been no pain, no paralysis, no anæsthesia, no fracture, practically no loss of function, and X ray examination has in each case been negative. Yet in each case there has been an obviously increasing asymmetry of the face—the chin deviated away from the side of the lesion and marked bulging both above and below the zygoma.

The only "positive" sign has been a slight hyperæmia of the side of the lesion. I have attributed the asymmetry to vaso-motor disturbance due to injury in the pterygo-maxillary fossa, and in one of the cases I thought there was a deep hæmatoma due to wounding of the internal maxillary artery.

I would suggest that Captain Edmond's case might have a like origin, but instead of a small fragment being the causative factor a relatively small new growth might have a similar effect. I am, Sir, yours faithfully,

H. P. PICKERILL,

The Queen's Hospital, Sidcup, Kent, April 6th, 1918. Major, N.Z.M.C.

OZONE IN CASES OF GASSING.

To the Editor of THE LANCET.

SIR,—I beg to draw your attention to the excellent results produced by inhalations of ozone generated from atmospheric air in cases of gassing. I have used ozone in several cases of this kind and also in cases of pneumonia, bronchitis, &c., and during the last 20 years; when generated by the silica tubes and properly administered, it is *absolutely non-irritating* and seldom fails to bring relief or cure. It is a powerful agent in the formation of oxyhæmoglobin, increasing it when inhaled by 3½ per cent. In many sinus cases, &c., it arterialises the blood in the wounds. It is a complete germicide and renders sputum and wound discharges microscopically aseptic. It is a strong heart stimulant.

The apparatus for generating ozone is simple and portable, and light. It can be worked with a motor air-pump wherever there is an electric-light current or with an air reservoir where there is no electric-supply.

I earnestly suggest that this treatment should be extensively used, as I am sure the best results will be obtained. It is economical and convenient, as it does away with the use of pure oxygen and cylinders, as only atmospheric air is used from which the ozone is generated.

I am, Sir, yours faithfully,

GEORGE STOKER,

St. George's-road, S.W., March 30th, 1918. Major, R.A.M.C.

ARTIFICIAL FROST-BITE.

To the Editor of THE LANCET.

SIR,—Reading Captain N. C. Lake's interesting article in THE LANCET of Oct. 13th, 1917, on the Effects of Cold upon the Body, one notes that he failed to obtain "frost-

bite" results without actual freezing of the tissues. This leads me to point out that freezing of the tissues is not always productive of frost-bite. We commonly freeze the surface tissues with ethyl chloride in producing local anæsthesia, and only meet with frost-bite in those cases where exploratory punctures only are effected through the frozen area; never when the area is freely incised, as in opening an abscess.

I would accept Captain Lake's statement that short of actual tissue destruction much of the damage observed is due to exudation, and would explain the absence of frost-bite in these cases by the free escape of the exudate permitted by the incisions. Thus early incision of frost-bitten areas might minimise the tissue destruction, and cupping or simple deep scarification may prove valuable in the treatment of some forms of "trench foot."

I am, Sir, yours faithfully,

H. LEIGHTON KESTEVEN.

Gladstone, Queensland, Jan. 30th, 1918.

ARMY NEPHRITIS.

To the Editor of THE LANCET.

SIR,—I read in Captain C. F. Coombs's article on Army Nephritis in THE LANCET of April 6th that morphia gr. ¼ was given hypodermically for uræmic convulsions, and "no bad effects followed in any case" (p. 498, line 73).

I have not my case-book with me, but I well remember causing morphia gr. ¼ to be administered by the skin to a girl, aged 9 years, who had a convulsion during post-scarlatinal nephritis. In her case the fit was not repeated, and all albumin disappeared from her urine within five days. Her younger brother had the same disease but no convulsion, and was not treated with morphia. In his case the albumin persisted in the urine for several weeks, in spite of all ordinary treatment. I gave this apparently dangerous amount of morphia because of the undoubted success which had followed the hypodermic injections of morphia gr. ¼ to gr. i. in many cases of puerperal eclampsia. In all these puerperal cases the albumin quickly disappeared from the urine.

It would be interesting to know whether it did so also in those cases of Captain Coombs in which morphia was used, and more rapidly than in the other patients.

I am, Sir, yours faithfully,

REGINALD HARTLEY, M.D. Durh., F.R.C.S. Edin.

Tunbridge Wells, April 6th, 1918.

THE HOME OF RECOVERY, GOLDERS GREEN.

To the Editor of THE LANCET.

SIR,—I read your admirable annotation on "The Home of Recovery, Golders Green," with great appreciation. Treatment of neurasthenics to be really efficacious demands certain special personal qualities in the medical men in charge as well as special training for the work. When so many members of our profession are now urgently required for more active service it may be well to ask whether sufficient use is made of the older members, who are able and willing to do their part in promoting the recovery of injured soldiers. Surely in times like these an age limit should not be rigorously enforced. We are not all old at 65—e.g., General Foch.

I am, Sir, yours faithfully,

April 6th, 1918. M.D.

PARLIAMENTARY REPRESENTATION OF UNIVERSITIES.—Arrangements are now complete for the compilation of the Register of Parliamentary Electors of the University of Durham. All graduates, other than those holding honorary degrees, are qualified to be registered, and full particulars will be sent on application to the registrar, University Offices, Durham, but a stamped addressed envelope of foolscap size must be enclosed. A Bachelor's degree in any faculty gives the right to registration, but Licentiates in Theology only are not qualified to be registered.

Obituary.

ALFRED HENRY CARTER, M.Sc. BIRM., M.D. LOND., F.R.C.P. LOND.

Dr. Alfred Henry Carter, who died at his residence at Abingdon on April 4th, aged 69, was for many years a well-known consulting physician residing in Birmingham, but being called into counsel over all the Midland district. For 40 years his high reputation among all classes of the community was deserved by the important character of his work.

Carter was the son of a Wiltshire medical man, was educated at Epsom, and studied for his profession at University College, London. He qualified by taking the M.R.C.S. Eng. and the L.S.A. in 1870, graduating in medicine with honours a year later at the University of London. Like so many young and energetic men of his day, he served in a field hospital throughout the Franco-German War, returning to take up resident posts at University College Hospital. In 1872 he proceeded to the M.D. Lond., and after brief service in the General Hospital at Wolverhampton was appointed pathologist to the General Hospital, Birmingham. He shortly obtained honorary positions on the staffs of the Children's Hospital and Queen's Hospital, Birmingham, and his private practice began to grow rapidly. In 1891 he became a Fellow of the Royal College of Physicians of London. As academic and clinical teacher both at the Queen's Hospital and at Mason College, where he was professor of physiology and therapeutics, he became well known, and when the educational work of the hospital was transferred to the College his chances increased and he was appointed examiner in the University of Aberdeen and later in that of London, while he delivered the Ingleby lecture at Mason College. In 1900 came about the constitution of the University of Birmingham, in which Carter was deeply and actively concerned. When Mason College, of which he was for some time honorary secretary, became practically erected into the University he was appointed professor of medicine, and was exceedingly successful in his new educational and administrative work from the beginning, for though a quiet and in some senses a retiring man he was a forceful character and devoted to his ideals. The honorary degree of Master of Science in the University was awarded to him in 1901 in special recognition of his services.

Although Carter wrote a good many short clinical papers, and was responsible for the usual number of public addresses, he was not a prolific author, but with one book alone he became one of the best-known British medical authors. The first edition of Carter's famous "Elements of Practical Medicine" appeared in 1881, at a time when the rapid and exact progress of medical knowledge made impossible any attempt to get between the covers of one book of convenient size a comprehensive picture of our science. There were at the time excellent manuals, and one or two systems and dictionaries of varying value in their different departments; such manuals and systems were bound to be replaced by larger and more modern substitutes, and the need for an authoritative epitome was felt by the students, if not by their teachers. The teachers held that such epitomes were best formed by their own lectures and their pupils' notebooks, and if all academic and clinical lecturers had been, or could be, competent for their work, and if all medical students had been, or could be, industrious and methodical, no doubt the teachers' view was right. But, as a matter of fact, the warning against Carter's "Elements of Practical Medicine," uttered in many lecture theatres, was completely disregarded; the work had from the beginning a large public, and thoroughly deserved its success, for it contained the essentials of medicine stated in clear and explicit language without overburdening the reader with side issues and doubtful points. The facts were presented in a dogmatic way, this plan leaving no space for the proving of statements. In the course of five years four editions appeared without much modification and served numerous medical students in different ways—as an index to larger works, as a ready-made note-book, as a scheme on which to plan systematic study, and as a guide to rapid revision before examinations. Fifteen years later the book, still preserving much of its original shape and scope, was enjoying the same popularity

in a larger form, for as the authoritative literature of the various subjects grew in detail with advancing knowledge, so did the elements expand, despite the most resolute attempt to keep the teaching elementary. The last edition, which was published some two years before the outbreak of the war, was as good as its predecessors. Carter was also the author of a text-book of Physical Exercises for Elementary Schools, and contributed to these columns, to the *British Medical Journal*, and to several scientific compendiums and journals.

While he was in Birmingham Carter took a considerable interest in the public health of the city. He was a member of the City Council and Public Health Committee, where his work was of a valuable and progressive nature in circles where local government has always been of a remarkably high standard. He was honorary treasurer of the Central Division Liberal-Unionist Association—and many men have been knighted for less onerous political work,—one of the founders of the City Athletic Institute, president of the Birmingham Debating Society, and a J.P. for the County of Warwickshire, regularly discharging his duties on the bench.

On leaving Birmingham four years ago he resigned his numerous appointments and took up his residence at Abingdon. At the outbreak of war he served two different military base hospitals with the expeditionary forces, and later was in medical direction of the transport of the sick and wounded in the Mediterranean. His only son was killed on the Western Front in the summer of 1915.

BENJAMIN SIMMONS, M.R.C.S., L.S.A.—Mr. B. Simmons died recently at his residence, Wotton-under-Edge, Gloucestershire, in his eighty-fourth year. Mr. Simmons had formerly an extensive practice and was one of the best-known Gloucestershire practitioners. He took a great interest in all things connected with the welfare of Wotton-under-Edge and was for 35 years churchwarden of the parish church.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Medical Men and Military Service.

IN asking leave to bring in the Military Service Bill the Prime Minister, in the House of Commons on April 9th, said that it was proposed to raise the military age to 50. It might be necessary, he added, to raise the age to 55 for special classes possessing special qualifications, such as medical men.

The Military Service Bill was read a second time in the House of Commons on Wednesday, April 10th. The Home Secretary in the course of the debate mentioned, in referring to the higher age-limit for medical men, that they were urgently and immediately required.

The first subsection of Clause 1 of the Military Service Bill, which includes the provision as to medical men, is in the following terms:—

> Every male British subject who has, at any time since the fourteenth day of August nineteen hundred and fifteen, been, or who for the time being is, in Great Britain, and who at the date of the passing of this Act has attained the age of eighteen years and has not attained the age of fifty-one years, or who at any subsequent date attains the age of eighteen years shall, unless he is for the time being within the exceptions set out in the First Schedule to this Act, be deemed, as from the date of the passing of this Act, or as from that subsequent date, or, if having been within those exceptions he subsequently ceases so to be, as from the date on which he so ceases, as the case may be, to have been duly enlisted in His Majesty's regular forces for general service with the colours or in the reserve for the period of the war, and to have been forthwith transferred to the reserve: Provided that—(*a*) if it appears to His Majesty at any time that it is necessary so to do for the Defence of the Realm, His Majesty may by Order in Council declare that the foregoing provision shall, as respects men generally, or as respects any class of men, have effect, as from a date specified in the Order, as if any age specified in the Order not exceeding fifty-six years were therein substituted for the age of fifty-one years; and (*b*) as respects any person being a duly qualified medical practitioner, the foregoing provision shall have effect as if the age of fifty-six years were therein substituted for the age of fifty-one years.

Maternity and Child Welfare Bill.

The following motion has been put down by Lord HENRY CAVENDISH-BENTINCK, Major ASTOR, and Major HILLS, to be moved in regard to the second reading of the Maternity and Child Welfare Bill:—

> "That, in the opinion of this House, a Bill dealing with maternity and child welfare is not satisfactory unless it is accompanied by legislation combining in a Ministry of Health the Local Government Board and the Health Insurance Commissions for England and Wales, and taking powers to transfer thereto the health functions of other Government departments."

HOUSE OF COMMONS.

TUESDAY, APRIL 9TH.

Soldiers and Vaccination.

Mr. CHANCELLOR asked the Under Secretary for War whether soldiers in France were being refused leave to which otherwise they would be entitled unless they could show good vaccination marks; and, if so, whether this restriction would be at once withdrawn and soldiers granted the leave to which they were entitled, irrespective of marks on their arms or elsewhere, good or otherwise.—Mr. MACPHERSON replied: No, sir. Instructions to this effect have been issued by the Field Marshal Commanding-in-Chief in France. In view of the outbreak of small-pox in London it is not proposed to withdraw this restriction at present.

Medical Arrangements in Mesopotamia.

Sir J. JARDINE asked the Under Secretary for War whether he could give information in detail as to the presence of medical officers and nurses, the provision of hospitals, and the supply of fresh vegetables and fruits to the British and Indian troops stationed at Ramadi and Hit, on the River Euphrates.—Mr. MACPHERSON answered: No sick or wounded are retained at Ramadi or Hit. They are evacuated by motor ambulance, convoy, or boat to Dhibban and thence by ambulance tonga trains to Bagdad, where there is ample hospital accommodation. Medical officers are present with units, field ambulances, and casualty clearing stations, but no nurses for the reasons given above. Fresh vegetables up to full ration scale have been sent from Bagdad, as the quantity available locally is negligible. While troops are on operations no fruit is issued, but there are ample stocks of dried and tinned fruits in the area.

Notification of Births (Extension) Act, 1915.

Major ASTOR asked the Secretary for Scotland what the total estimated expenditure would be for the current year and for the next year respectively on the schemes for providing treatment for mothers and young children under the Notification of Births (Extension) Act, 1915, which had been sanctioned, and for the 14 schemes which were in operation but had not yet been sanctioned.—Mr. MUNRO wrote in reply: The total expenditure estimated to be incurred during the local financial year ending May, 1918, and which will be claimable against the grant in aid of maternity service and child welfare, is, in respect of the 53 local authorities for which schemes have been sanctioned, £15,000; and in respect of the 14 schemes in operation but not yet sanctioned £17,000. No estimate of the expenditure to be incurred during the year 1918–19 is available.

Major ASTOR also asked whether the Local Government Board for Scotland provided capital and maintenance grants respectively towards schemes for providing treatment under the Notification of Births (Extension) Act.—Mr. MUNRO replied: The Board provides only one grant against which approved capital and maintenance expenditure is claimable.

Major ASTOR asked how many authorities had provided midwifery treatment under this Act.—Mr. MUNRO answered: Twenty-nine local authorities have provided such treatment under schemes sanctioned by the Local Government Board for Scotland.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations recently held the following candidates were successful in the subjects indicated:—

PRIMARY EXAMINATION, PART II.

Anatomy.—L. W. Hefferman, Middlesex Hospital; J. Herbert, Guy's Hospital; G. F. W. Howorth, Middlesex Hospital; E. R. Lloyd, Glasgow; H. J. Lyon, Guy's Hospital; B. A. Sledle, University College Hospital; F. Smith, Manchester; J. Solomonoff, London Hospital; and J. H. Sullaiman, Guy's Hospital.

Physiology.—P. Green, Guy's Hospital; L. W. Hefferman and G. F. W. Howorth, Middlesex Hospital; J. H. Johnston, King's College; H. J. Lyon, Guy's Hospital; G. W. Robinson, King's College; B. A. Sledle, University College Hospital; F. Smith, Manchester; and J. Solomonoff, London Hospital.

UNIVERSITY OF DURHAM: FACULTY OF MEDICINE.—At the Convocation held on March 30th the following degrees were conferred:—

DOCTOR OF MEDICINE.

Charles Edward de Silva, John Robert Dunn Holtby, Harold Dickinson Senior, Cuthbert Rex Wilkins.

DOCTOR OF MEDICINE FOR PRACTITIONERS OF FIFTEEN YEARS' STANDING.

Charles Uncles Ind.

BACHELOR OF MEDICINE (M.B.).

Ewart Gordon Anderson, James Allan Berry, John Gilmour, and Harold Sterne-Howitt.

BACHELOR OF SURGERY (B.S.).

Ewart Gordon Anderson, James Allan Berry, John Gilmour, Iskander Soliman, and Harold Sterne-Howitt.

Vacancies.

For further information refer to the advertisement columns.

Battersea Polytechnic, S.W.—Fem. Asst. Lect. £200.
Bethnal Green Infirmary.—Res. Asst. M.O. £350.
Bolingbroke Hospital, Wandsworth Common.—H.S. £150.
Brighton County Borough, Isolation Hospital.—Res. M.O. £300.
Brighton, Royal Sussex County Hospital.—H.P. £100.
Bristol Royal Infirmary.—H.P. and H.S. £120.
Central London Throat and Ear Hospital.—Res. H.S.
Edinburgh, Craiglockhart Poorhouse and Hospital.—Asst. M.O. £250.
Endsleigh Palace Hospital for Officers.—Res. M.O. £1 1s. per day.
Flintshire Education Committee.—Temp. Asst. M.O. £350.
Glasgow Corporation.—Temp. Asst. Tuberculosis Officer. £400.
Harrogate Infirmary.—H.S.
Hospital for Consumption and Diseases of the Chest, Brompton.—H.P. 30 guineas.
Ipswich, County of East Suffolk.—Asst. County M.O.H. £375.
Liverpool, Royal Southern Hospital.—Hon. S.
Manchester Royal Eye Hospital.—H.S. £120.
Manchester Royal Infirmary.—Asst. Res. Surg. Officer. £350.
Margate, Royal Sea Bathing Hospital for Surgical Tuberculosis.—S.
National Hospital for the Paralysed and Epileptic.—Jun. H.P. £150.
Northampton General Hospital.—Jun. H.S. £150.
Notts Education Committee.—Asst. School M.O. £400.
Royal College of Surgeons of England.—Examiners.
Royal South Hants and Southampton Hospital.—H.P. £100.
Royal Waterloo Hospital for Children and Women, S.E.—Sec. Female Res. M.O. £150.
Salford Union Infirmary.—Third Res. Asst. M.O. £250.
Scottish Women's Hospitals, 2, St. Andrew-square, Edinburgh.—Female Asst. Surgs for France and Macedonia. £300.
Sheffield, Jessop Hospital for Women.—Jun. Female H.S. £175.
Sheffield Royal Infirmary.—H.S. £120.
Somerset County Education Committee, Weston-super-Mare.—Sch. Oculist and Med. Insp. £450.
Stoke-on-Trent, North Staffordshire Infirmary.—Sec. and H. Gov. £600.
Swansea Education Committee.—Asst. Sch. M.O. £400.
Winchester City.—Asst. M.O.H. and School M.O.H. £400.
York, County Hospital.—Fem. H.P. £200.

Births, Marriages, and Deaths.

BIRTHS.

GRANT.—On April 6th, at Bardsea, Liscard, Cheshire, the wife of Captain Colin Grant, R.A.M.C., of a son.

McLEAY.—On March 31st, at Wallington, the wife of C. W. McLeay, M.D., West African Medical Service, of a daughter.

PEARSON.—On March 29th, at London-road, Leicester, the wife of Dudley Garencieres Pearson, M.B., R.A.M.C., of a daughter.

THORNLEY.—On April 7th, at Ravensdene, Scarborough, the wife of Captain J. H. Thornley, R.A.M.C., of a daughter.

MARRIAGES.

DEVEREUX—ROBATHAN.—On April 3rd, at Holy Trinity, Clapham Common, by special licence, Arthur C. Devereux, Captain, R.A.M.C. (T.), to Gladys, daughter of the late G. B. Robathan, M.R.C.S., Risca (Mon.), and Mrs. Robathan, Llandaff.

FALLON—POWELL.—On Feb. 23rd, at Mhow, India, Colonel James Fallon, A.M.S., A.D.M.S., to Katharine Frances, eldest daughter of Mr. and Mrs. Powell, Gloucester-terrace, Hyde Park.

MEAKER—FORD.—On April 4th, at Christ Church, Esher, Samuel Raynor Meaker, B.A., M.D., Lieutenant, R.A.M.C., of Boston, Mass., U.S.A., to Kathleen Edda, elder daughter of Mr. and Mrs. Lawton Ford, of Esher.

SIMPSON—REID.—On April 2nd, at St. James's Church, Muswell Hill, Ker Simpson, Captain, R.A.M.C., to Kathleen Elizabeth, youngest daughter of the late Mr. and Mrs. Herbert John Reid, of London.

DEATHS.

BIRD.—On March 30th, at Wellington, India, Lieutenant-Colonel Robert Bird, M.V.O., C.I.E., I.M.S., M.D., M.S., F.R.C.S., aged 51.

CARTER.—On April 4th, at The Lindens, Abingdon, Berks, Alfred H. Carter, M.D., F.R.C.P., J.P., late Lieutenant-Colonel, R.A.M.C., aged 69.

CHITTY.—On April 5th, at The Buckstone, Shepherd's Hill, Highgate, Alfred Goldney Chitty, M.R.C.S. Eng., L.R.C.P. Edin., in his 60th year.

CROLE.—On March 23rd, killed in action, Captain David Clement Crole, R.A.M.C., attached Hussars.

CROWFOOT.—On April 6th, at Blybargate House, Beccles, Suffolk, from heart failure, William Miller Crowfoot, M.B. Lond., F.R.C.S., J.P., aged 80.

GRIFFIN.—On March 21st, killed in action, Captain (temporary) Ernest Harrison Griffin, D.S.O., M.C., R.A.M.C.

HARVEY.—On April 1st, suddenly, Charles William Harvey, M.B. Lond., M.R.C.S., L.R.C.P. Lond.

JAMES.—On the 6th inst., suddenly, at 71, St. Mark's-road, North Kensington, Moses Prosser James, M.D., late lecturer on materia medica at the London Hospital, and physician to the Golden-square Throat Hospital, W., aged 82 years.—R.I.P.

JONES.—On April 3rd, at Victoria, British Columbia, O. Meredith Jones, F.R.C.S.

MOYNIHAN.—On April 8th, at Carr Manor, Meanwood, Leeds, Eva Ellen Moynihan, daughter of the late Captain Moynihan, V.C., 8th (King's) Regiment.

TAYLOR.—On April 3rd, at a Canadian Stationary Hospital, of wounds, Captain H. Hampden Taylor, R.A.M.C., attached Royal Welsh Fusiliers.

WEBB.—On March 29th, of wounds, Captain G. Harvey D. Webb, R.A.M.C., T.F., attached Dragoon Guards.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

Monday, April 15th.

OPEN DISCUSSION BY THE FELLOWS: at 5 P.M.

Subject:
"The Future of the Medical Profession under a Ministry of National Health."
The discussion will be opened by Dr. J. F. Gordon Dill (Hove), and Sir Arthur Newsholme, Sir William Osler, and others will take part.
N.B.—It is hoped that Members of the Section of **EPIDEMIOLOGY AND STATE MEDICINE** will endeavour to attend.

Tuesday, April 16th.

SPECIAL GENERAL MEETING OF FELLOWS, at 5 P.M.

Business:
(1) To consider and, if approved, to confirm the following amendment of the By-laws made by the Council, viz.:—
Chapter VI., Section 1.—The following words to be added at the beginning of the Section: "unless he has compounded for his Annual Subscription by the payment of £75."
(2) Ballot for Election to the Fellowship. (Names already circulated.)

MEETINGS OF SECTIONS.

Monday, April 15th.

EPIDEMIOLOGY AND STATE MEDICINE (Hon. Secretaries—W. Butler, M. Greenwood).
The special attention of Members of this Section is called to the Meeting of Fellows on the 15th announced above.

Tuesday, April 16th.

THERAPEUTICS AND PHARMACOLOGY (Hon. Secretaries—W. Langdon Brown, Philip Hamill, J. Gordon Sharp): at 4.30 P.M.
Annual Meeting.
Paper:
Dr. A. J. Whiting: The Comparative Value of the Digitalis Group of Remedies in Auricular Fibrillation.
Members of the Section of MEDICINE are invited to attend.

PATHOLOGY (Hon. Secretaries—Gordon W. Goodhart, J. A. Murray): at 8.30 P.M.
Papers:
Dr. E. H. Kettle: Tumours arising from Endothelium.
Dr. J. A. Murray: Further Illustrations of Autologous Grafting.

Thursday, April 18th.

DERMATOLOGY (Hon. Secretaries—J. E. R. McDonagh, Henry MacCormac; Hon. Acting Secretary—S. E. Dore): at 5 P.M.
Cases will be shown at 4.30 P.M.

Friday, April 19th.

OTOLOGY (Hon. Secretaries—Somerville Hastings, J. F. O'Malley): at 5 P.M.
Paper:
Mr. Richard Lake: Aural Bacteræmia.
Cases and Specimens will be shown at 4 P.M. by the President (Dr. H. J. Banks Davis), Mr. W. M. Mollison, Mr. Richard Lake, Mr. Somerville Hastings, and others.

ELECTRO-THERAPEUTICS (Hon. Secretaries—E. P. Cumberbatch, Robert Knox): at 8.30 P.M.
Paper:
Dr. E. P. Cumberbatch: Surgical Diathermy.
Members of the Section of LARYNGOLOGY and of the Section of SURGERY are specially invited to attend.

ILLUMINATING ENGINEERING SOCIETY, House of the Royal Society of Arts, John-street, Adelphi, W.C.
TUESDAY, April 16th.—5 P.M., Paper:—Prof. W. M. Bayliss: Light and Vision: the Physiology of the Retina.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.
MONDAY, April 15th.—5 P.M., Museum Demonstrations in Pathology:—Mr. S. G. Shattock: II., Necrosis.
The demonstrations are open to Medical Students and Practitioners. First-Aid and Ambulance Students, desirous of attending, will be admitted.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
Clinics each week-day at 2 P.M., Wednesday, Friday, and Saturday also at 10 A.M.
(Details of the Post-Graduate Course were given in the issue of March 30th.)

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.
Out-patients each day at 2.30 P.M.
(Details of the Post-Graduate Course were given in the issue of April 6th.)

THE THROAT HOSPITAL, Golden-square, W.
MONDAY, April 15th.—5.15 P.M., Special Demonstration of Selected Cases.
THURSDAY.—5.15 P.M., Clinical Lecture.

ROYAL INSTITUTION OF GREAT BRITAIN, Albemarle-street, Piccadilly, W. 1.
THURSDAY, April 18th.—3 P.M., Lieutenant-Colonel C. S. Myers, R.A.M.C.: Present-day Applications of Experimental Psychology. (Lecture II.)

EDITORIAL NOTICES.

In consequence of the pressure on our space and the shortage of paper, the Editor may be compelled to abbreviate communications, as an alternative to their rejection, when time does not allow them to be reconsidered by their authors.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON, W.C. 2.

Communications, Letters, &c., to the Editor have been received from—

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I.—Invalid Children's Aid Association, Lond., Sec. of; Capt. A. J. H. Iles, R.A.M.C.(T.); Capt. A. C. Inman, R.A.M.C.
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N.—National Baby Week Council, Lond.; Dr. D. Nabarro, Lond.
O.—Dr. W. D. O'Kelly, Dublin; Sir William Osler, Bart., Oxford.
P.—Dr. B. Pierce, York; *Punch*, Lond., Editor of; Major H. P. Pickerill, Sidcup; Dr. E. P. Poulton, Woldingham; Dr. E. Pritchard, Lond.; Dr. F. W. Price, Lond.; Dr. H. W. Pooler, Stonebroom.
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METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, April 10th, 1918.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
April 4	...	69	50	41	41	46	Overcast
,, 5	0·01	86	56	36	40	42	Overcast
,, 6	...	61	52	39	48	50	Cloudy
,, 7	0·23	89	53	37	42	44	Cloudy
,, 8	0·12	86	55	44	43	45	Cloudy
,, 9	...	63	50	41	45	45	Overcast
,, 10	0·05	50	47	42	47	47	Raining

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

BOOKS, ETC., RECEIVED.

BAILLIÈRE, J. B., ET FILS, Paris.
Le Cœur et L'Aorte. Etudes de Radiologie Clinique. Par H. Vaquez, Professeur agrégé à la Faculté de Médecine de Paris, et E. Bordet, Chef de Laboratoire adjoint à la Faculté de Médecine de Paris. 15 francs.

BLACK, A. AND C., London.
Radiography and Radio-therapeutics. By Robert Knox, M.D. Edin. Part II. 15*s.*

HEADLEY BROS., London.
Village Life After the War. 1*s.*

LONGMANS, GREEN, AND CO., London.
Lecithin and Allied Substances. The Lipens. By H. Maclean, M.D. 7*s.* 6*d.*

MANCHESTER UNIVERSITY PRESS, Manchester, and LONGMANS, GREEN, AND CO., London.
Megalithic Culture of Indonesia. By W. J. Perry. 12*s.* 6*d.*

UNIVERSITY OF LONDON PRESS, London.
Military Medical Manuals. Under the general editorship of Sir Alfred Keogh.
Wounds of the Skull and Brain. By Ch. Chatelin and T. de Martel. Edited by F. F. Burghard, C.B., M.S. 7*s.* 6*d.*
Wounds of the Abdomen. By J. Abadie. Edited by Colonel Sir W. Arbuthnot Lane, C.B., M.S. 7*s.* 6*d.*
Localisation and Extraction of Projectiles. By Assistant Professor Ombrédanne and M. Ledoux-Lebard. Edited by Major A. D. Reid, C.M.G., R.A.M.C. (T.). 10*s.* 6*d.*
Wounds of the Vessels. By L. Sencert. Edited by F. F. Burghard, C.B., M.S. 6*s.*
War Otitis and War Deafness: Diagnosis, Treatment, Medical Reports. By Drs. H. Bourgeois and Sourdille. Edited by Major J. Dundas Grant, R.A.M.C. 6*s.*
Malaria in Macedonia. By P. Armand-Delille, P. Abrami, G. Paisseau, and Henri Lemaire. Edited by Lieut.-Col. Sir Ronald Ross, R.A.M.C. (T.). 6*s.*
Abnormal Forms of Tetanus. By M. Courtois-Suffit and R. Giroux. Edited by Surg.-Gen. Sir David Bruce and Frederick Golla, M.B. 6*s.*

The following journals, magazines, &c, have been received:—Annales de la Facultad de Medicina, Montevideo, American Medicine, Military Surgeon, Archives of Internal Medicine, American Journal of Orthopedic Surgery, American Journal of Obstetrics, Revista de Medicina, Cartagena, Archives Médicales Belges, Revue d'Hygiene et de Police Sanitaire, Archives de Médecine et de Pharmacie Militaires, American Journal of Surgery, St. Bartholomew's Hospital Journal, Revista Medica del Uruguay, Revista Medica de Málaga, Cleveland Medical Journal, Journal of the Missouri State Medical Association, Dominion Medical Monthly.

Notes, Short Comments, and Answers to Correspondents.

A LINK IN THE COÖRDINATION OF MEDICAL INSPECTION.

Dr. E. Halford Ross sends us a report which he has drawn up, as certifying surgeon to the City of London, on the coördination of the medical inspection of school children with the medical inspection of young persons in factories and workshops of the City of London. The report has been presented to H.M. Chief Inspector of Factories, the Education Committee of the London County Council, and the London Advisory Committee for Juvenile Employment of the Ministry of Labour, and has been accepted by the authorities concerned. It runs as follows:—

In London school children are inspected periodically by the school doctors, and, as a result, each child's physical and mental defects are examined and recorded, while in suitable cases treatment is recommended which in many instances is carried into effect. When the child leaves school the records of these examinations and treatments are retained by the school medical officer, and a short resumé is sent to the Labour Exchange nearest his or her home. Here the records of the medical history of the child stop. In the factory one more medical inspection is made, by the certifying surgeon; but he has no information in his possession of the findings of the school doctors and no knowledge of the child's defects or treatments except what he can glean from the child or from his one examination.

As certifying surgeon in the City of London I found this want of coördination between these medical inspections a great disadvantage, for I knew nothing about the former medical history of the children or young persons who presented themselves as learners and apprentices in various industrial establishments. It was realised that it would be a great advantage if the inspections in the factory could be coördinated with those in the school, so that a further attempt might be made to remedy those defects which remained untreated from the school age; it would enable me to get a better idea as to each child's fitness for work; it would render the medical inspections in the school and in the factory continuous; it would be a starting-point for the additional observation and record of the health of young persons during adolescence; and it would be a means of interesting those employers who are careful of the welfare of their employees, for they would know that a medical history of each worker was being kept during the years of training and afterwards.

There were some initial difficulties in coördinating the results of these inspections. Owing to the size of the Administrative County of London, to the great number of children who complete their school education in the many schools every term, and to the fact that only a percentage of such children obtain employment in the factories and workshops, it was found impracticable for the school medical officer to supply me direct with the medical records of all the children leaving school. Even had such a procedure been convenient I should have been inundated with a mass of information about a number of young persons with whom I had no concern. The suggestion that the children on leaving school should take their medical records with them into the factories, and show them to me there, was also found to be not feasible because, in some cases, these records contain confidential medical information which it would be wrong for the child to know.

The solution of the problem has been obtained through the London Central Advisory Committee for Juvenile Employment of the Ministry of Labour. Permission was granted by the Education Committee of the London County Council, at the instance of Dr. Hamer, the school medical officer, for the final report of the school doctors to be sent from the Labour Exchanges to me in the cases of those young persons placed by them in factories and workshops of the City. It was arranged that when a child, on leaving school, obtained work in a factory, the Labour Exchange should send me "Form A," stating the child's name and address, and an abstract of the school doctor's report, as well as the name of the factory, under confidential cover.

Although this arrangement has been in operation for a few weeks only the results have been most satisfactory. I have obtained a number of reports about the young persons starting work in the City of London, and in many instances I have been able to continue the treatment of defects instituted by the school doctors. Sometimes the reports sent me by the Labour Exchanges have shown that girls were under treatment at school for chlorotic anæmia. I have been able to see that their treatment has been continued while in the factory, have sent many such cases to their own doctors, have obtained the coöperation of the employers and the assistance of the overlookers in seeing that these girls go on obeying their doctors' instructions, and they are given time to do so. In several instances defects which were not remedied at school have been remedied now owing to this arrangement while at work in the factory. Sometimes parents refuse to follow the recommendations of the school doctors as to operations for adenoids, tonsils, carious teeth, and even the supply of spectacles, or to teach their children cleanliness. Yet in many instances these refractory parents have given way when they found that their children might not be able to earn wages until their physical defects, discovered years before at school and always deferred treatment, were removed; for they know that the certifying surgeon has the power to refuse certain defective young persons for certain employments under the Factory Acts. In most cases persuasion has succeeded when the parents discovered that I was in accord with the school doctors and coöperating with them to obtain the proper medical treatment of the children.

Many children on leaving school obtain employment in London through sources other than the Labour Exchanges. On finding such children in the factories I send their names, addresses, and schools attended to the Labour Exchanges nearest their homes on "Form B." This form is returned to me with the school doctor's report attached; and on my next visit to the factory I am able to continue the treatment or observation of the conditions (if any) of such young persons in the same way as those placed at work by the Labour Exchanges.

In the event of a young person being found unsuitable to work in any particular trade, industry, or factory, and I refuse a certificate of fitness, it has been arranged that the same procedure should be adopted, and the name and address is sent to the Labour Exchange. The Local Juvenile Committee then proceeds to obtain more suitable employment. I am able to state that already several cases have been dealt with in this way. Cases of quiescent pulmonary tuberculosis have been transferred from London printing works to better occupation in the country, deformed children have been referred to various organisations for the supply of apparatus and to centres of physical training, suitable work has been found for cripples, and even adults have been dealt with in this way.

In conclusion I can only repeat that this arrangement is working most satisfactorily, and Dr. Legge, His Majesty's Chief Medical Inspector of Factories at the Home Office, is taking steps to extend it to other parts of the Administrative County of London. The successful working of the scheme and its organisation is due to the energy displayed by Miss D. H. Jones, the secretary of the London Central Juvenile Committee of the Ministry of Labour. From the outset it has greatly benefited by the encouragement of Dr. Hamer and Dr. Thomas, of the School Medical Service of the London County Council, to whose permission its accomplishment is due.

We have no doubt that the suggested coördination is likely to prove useful and is worthy of extension.

THE NUMBER OF RATIONED PERSONS.

IN round figures the number of persons now rationed in regard to specified articles of diet is as follows: Sugar and meat, 37 million; butter and margarine, 36 million; tea, 18 million; cheese, 2 million; lard, 1½ million; and other foodstuffs, such as jam and syrup, ½ million.

THE PUBLIC MEANS OF CLEANLINESS.

THE Carnegie United Kingdom Trust has done a real public service in issuing a report on the public baths and wash-houses in the United Kingdom. Miss Agnes Campbell, who has compiled the report, quotes the remark of a miner, "There's plenty air and plenty water, but they're baith hard to come by," adding that in this "hardness" lies the real sting of modern poverty. Ten years ago Dr. James Kerr went so far as to state that the majority of cases of injury to health among London school children might be traced originally to a want of cleanliness. Apart from medicinal bathing the earliest public wash-house was erected in Liverpool in 1842, Glasgow having possessed since the beginning of the century a private installation of baths due to the generosity of Mr. William Harley. Progress in the provision of facilities was slow and fitful until about the year 1875, and fortunately during the last decade a hundred or more local authorities have provided public washing facilities, the report giving a very complete survey of their construction, administration, and finance. The conclusions based upon the survey suggest that lack of coördination between the various authorities has led to some working inefficiency, and that the closer association of women in the management of baths is very desirable. The pertinent question is asked: Are baths and wash-houses of sufficient value to the community as a whole to justify their being made attainable by the poorest, or should there be an income limit below which cleanliness is only possible for paupers and prisoners? The Carnegie Trust has filled its purpose with the presentation of facts, and does not propose to grant financial aid towards the erection of public baths. The report is a large and handsome volume and has required much paper for its issue, but its value is great, and we dissent from those who have cavilled at the expense of production.

COLONIAL HEALTH REPORTS.

Gold Coast.—A belated report on this colony and its dependencies has recently been presented to Parliament. The total population amounted at the last Census in 1911 to 1,503,386. The number of European residents in 1916 was 2006, 589 being officials, 671 merchants, 637 employees of mining companies, and 109 attached to missions. Fourteen Europeans died during the year and 105 were invalided. Four deaths of officials occurred, 1 being due to blackwater fever, 1 to yellow fever, 1 to heart failure, and 1 to uræmia. There were 5 cases of yellow fever amongst Europeans, of which 4 proved fatal. Of 24 officials invalided, 6 were for malaria, 3 for neurasthenia, and 15 for various diseases. Of 81 non-officials invalided 15 were for malaria, 4 for malarial cachexia, 8 for blackwater fever, and 54 for various other diseases. No means exist whereby accurate statistics relating to the health of natives can be obtained. There was no serious outbreak of epidemic disease. Eight cases of sleeping sickness were treated during the year. The total number of vaccinations performed was 10,313, of which 7848 were successful. Generally speaking, the

health conditions of the colony, Ashanti, and the Northern Territories, especially in the larger towns, show some improvement.

In the hospitals and dispensaries of the colony the number of in-patients treated during the year was 2223, and of out-patients 30,325; included in these totals being 1748 Europeans. Dr. F. G. Hopkins, principal medical officer, retired from the public service during the year, and died in less than a month after his retirement; he was succeeded by Mr. T. H. Rice. The efforts of the sanitary and medical authorities in promoting hygiene and treatment of disease continue to exercise a beneficial effect on the general health of Europeans. The climate, though hot and damp, is cooler than that of most tropical countries situated in the same latitudes. It is not in itself unhealthy, but an evil reputation has been earned for it in the past by the prevalence of mosquito-borne diseases. The Gold Coast is peculiarly free from many of the discomforts associated with tropical countries; hot nights and intense heat by day are the exception rather than the rule, while insects are comparatively unobtrusive. The rainfall was exceptionally heavy in 1916; it was highest at Axim, where a total 110·45 inches fell on 82 rainy days, as compared with 81·25 inches and 76 rainy days in 1915. The highest mean shade temperature was 82·6° F. at Quittah, and the lowest 72·14° F. at Sunyani.

In a separate report on Ashanti, Mr. F. C. Fuller, the Chief Commissioner, mentions that the most prevalent causes of illness during the year were venereal diseases (especially in Coomassie among the soldiers and their wives), digestive system diseases, bronchial diseases, and ulcers. Among communicable diseases the most common were malaria, gonorrhœa, dysentery, secondary syphilis, and yaws. The native hospital in Coomassie was completed in 1915 and is much appreciated, judging from the large increase in the number of applications for medical treatment.

INVALID CHILDREN'S AID ASSOCIATION.

BY permission of Lady Garvagh, the annual meeting of the Invalid Children's Aid Association will be held at 4, Marble Arch on Tuesday, April 30th, at 3 P.M. Lord Leverhulme will preside, and Colonel Charters J. Symonds, F.R.C.S., Miss Violet Markham, and Miss Lilian Braithwaite are announced as being among the intending speakers. Tickets are necessary for admission, and they can be obtained from the secretary, 69, Denison House, 296, Vauxhall Bridge-road, S.W. 1.

THE TREATMENT OF MALARIA.

THE medical officer of health for the Falmouth and Truro Port Sanitary Authority (Dr. J. S. Hicks), in his annual report for 1917, states that he visited 281 vessels, and alludes to the prevalence among the cases of malaria of a severe type. Dr. Hicks treated these cases in the isolation hospital, and is of opinion that cases of malaria should be so disposed of owing to the increased number of mosquitoes in England and the difficulty of curing malaria unless the patient is subjected to thorough treatment.

PIGS AND POTATOES.

THIRTY years ago this doggerel was familiar:—

> "Dearly beloved brethren, isn't it a sin,
> When you eat potatoes, to throw away the skin?
> The skin feeds the pigs and the pigs feed you,
> Dearly beloved brethren, isn't it true?"

The sin, for such it is, remains. The amount of potato peel in the dustbins lined up in the streets in the early morning must run into enormous money. Ilford, in Essex, has recently started keeping pigs and feeding them with the scraps of food and peelings obtained from the households of the town and the scheme is likely to be imitated, for pigs are most prolific and fast growing of meat, and potatoes yield one of the greatest crops per acre of rapidly produced food. Of course, the potato varies largely in size and quality, some of the largest varieties being watery and unsubstantial. Potato selection and cultivation is an art, an art which was even carried to absurd lengths not many years ago, when fabulous prices were reached for certain varieties which were supposed to be disease-proof. Potato disease has been studied by experts for years with a view to overcoming it, and thus obtaining a potato which shall never be subject to rot and attack by fungi. Sprouted potatoes put into warm soil are the ideal for rapid growth and good yield, and the soil must have been ploughed or deeply dug, and not down to 9 inches only. Experiments were also made about a year ago proving that the disinfection of the soil with chlorinated lime yielded a great increase of tubers, showing that the chemistry of the soil repays study. Essex, which used to be the county which provided in the old days nearly all the potatoes eaten in London, has this year fallen sadly behind, and an appeal has been issued by the Government urging the inhabitants to make up leeway. It is the farmers who must do this more particularly and not the amateurs, and their encouragement nearly always is connected with the prospective market value of their goods and their rotation of crops. Six tons per acre is the British average, but 15 to 20 tons per acre are said by experts to be possible.

Up to the end of last week 251,474 new allotment plots had been arranged for throughout the country under the Cultivation of Lands Order by local authorities acting in coöperation with the Food Production Department, and especially in the North country there is keen rivalry among local authorities as to which shall supply the largest number of allotments per hundred of inhabitants.

RENAL SUSCEPTIBILITY IN SOLDIERS.

Mr. Haydn Brown writes to suggest that the greater incidence of nephritis in the Army, to which Captain Carey Coombs called attention in THE LANCET of April 6th, is due to a special renal susceptibility caused by the extra warmth contained under the pack. Prophylactic treatment should, he thinks, be recommended on these lines, and men be warned against cooling too quickly upon removing their packs and belts.

DOMESTIC FOOD PROBLEMS.

A house-to-house inquiry in a residential district, a correspondent writes, regarding the need for a public kitchen locally, has provoked a frank and varied expression of opinion which may throw some light on the solution of domestic food problems. We reproduce an unselected series of replies verbatim:

1. (*Mistress fails to appear*): My mistress says she's no use for such things having three good servants and they won't fetch food. Yes, ma'am, I sometimes says myself that she don't think much. There mayn't be no maids before long (*sotto voce*), but I think it's a fine idea, ma'am, and I wish you good luck.

2. (*Bachelor who descends tardily after a preliminary parley with an imposing cook-housekeeper*): I really do not think this is the kind of district for such an enterprise. We do not want one and I should not use it if there was one.—Oh, well: I am thinking of myself. There *may* be some people without maids but I thought we had all got servants in this part.—Well, yes: if you are thinking of the future of course we *might* have to come to such a thing!

3. (*Lady without servants*): No, I don't hold with such places. Everybody ought to cook their own food, lazy creatures! We Englishwomen are mostly fools at housekeeping; we don't bother. Now these kitchens will make them lazier than ever; it's disgraceful!—What? I shall always get coal, I've always had it!—No; it's a wrong idea to go and get food cooked somewhere else, it's better done at home!—Well, yes: I *am* a good cook, always have been, and I shall not use a public kitchen, never!

4. I am so glad to see you, it's a great idea. We are six.—My daughter and I can't get a maid of any sort, and the four men come down from town hungry every evening; we're sick of washing up, so we mostly have cold food: that's what it has come to.

5. (*Housemaid boy.*): My mistress hasn't filled the paper in. She didn't take no interest in it 'cause she don't want it herself; but I said to her, You don't know what we may have to come to. No, ma'am, some ladies don't think, really. I sometimes say she's one of that sort. It's a pity.

6. How very splendid! Yes; when will it start? We'll have 100 portions a week. I have at present only one maid, and she has struck for a holiday and is going to-morrow. I have struck too; I cannot cook for four children, a governess, and a hungry man from town without any help. So I am shutting up house and taking the children to a hotel at the seaside while the maid is away, and my husband will live at his club in London. When we come back he says he will gladly fetch things from the Public K. at 7 P.M. on his way from the station. It will be an excellent plan.

7. (*Stately lady very puzzled about "portions"*): Yes, but how am I to know how much the men will eat at night, and what *will* our butcher say? And who will bring it along? We must have it on Sundays, too. I shall not buy any vegetables; we've got heaps in the garden. Can I sell you some?

8. (*Maid running after lady canvasser*): Well, madam, my mistress won't have anything to do with it, you see, but *I* think it will be a boon to lots of people.

Mr. Moses Brain, of Warmley, celebrated the 100th anniversary of his birthday on April 2nd.

THE new residential South African University was inaugurated at Cape Town on April 2nd.

THE consumption of water per head of estimated population of Sydney during the year ending June 30th, 1917, was 40·9 gallons per day, as against 42·9 gallons in the previous year.

AT Plymouth, on March 30th, Mr. T. Glascott Vawdrey, L.R.C.P., M.R.C.S., was presented with an illuminated address and two framed photographs of the George-street Ambulance Corps in appreciation of his services as honorary surgeon for the past seven years.

SUNDAY schools at Hexham have, according to the *Hexham Courant*, been closed by order of the M.O.H. on account of a severe epidemic of measles, but cinemas remained open, as the M.O.H. has no power to deal with these.

IN an article in the February issue of the *Canada Lancet* on the combined treatment of syphilis by medicine and electric massage Sir James Grant expresses his belief that the time is not far distant when the whole domain of therapeutics will derive benefit from abdominal electric massage, which will have the result of counteracting the poisonous influence of gases in the alimentary canal and of promoting the absorption of remedies by the lacteals and lymphatics.